Installation and service instructions

for contractors

Vitocal 242-G

Compact heat pump with electric drive, 400 V~ and 230 V~

For applicability, see the last page

VITOCAL 242-G

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Please keep safe.

Safety instructions

Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

Danger
This symbol warns against the risk of injury.

Please note
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively designed for qualified personnel.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations

Observe the following when working on this system
- all legal instructions regarding the prevention of accidents,
- all legal instructions regarding environmental protection,
- the Code of Practice of relevant trade associations.
- all current safety regulations as defined by DIN, EN, DVGW, VDE and all locally applicable standards

Working on the system

- Isolate the system from the power supply and check that it is no longer 'live', e.g. by removing a separate fuse or by means of a main isolator.
- Safeguard the system against unauthorised reconnection.

Please note
Electronic modules can be damaged by electrostatic discharges.
Touch earthed objects, such as heating or water pipes, to discharge static loads.

Repair work

Please note
Repairing components that fulfil a safety function can compromise the safe operation of your heating system.
Replace faulty components only with original Viessmann spare parts.

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Safety instructions (cont.)

Ancillary components, spare and wearing parts

Please note
Spare and wearing parts that have not been tested together with the heating system can compromise its function. Installing non-authorised components and non-approved modifications or conversions can compromise safety and may invalidate our warranty.
For replacements, use only original spare parts supplied or approved by Viessmann.

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Installation

Please note
The installation room must be dry and free from the risk of frost. Ensure ambient temperatures of 0 to 35 ºC.

Please note
Observe the permissible floor load.

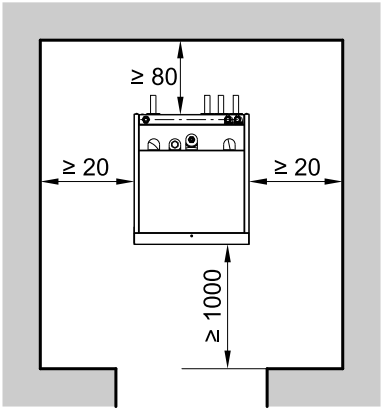
- Total weight of filled DHW cylinder:

BWT 106	491 kg
BWT 108	491 kg
BWT 110	498 kg

- To prevent structure-borne noise, never set up the appliance on ceilings with wooden joists (e.g. in the attic).
- Level the appliance.
  If the adjustable feet are used to compensate for an uneven floor (max. 10 mm), the pressure load on the feet must be distributed evenly.

Minimum room volume
Maintain the minimum room volume required by DIN EN 378; see Viessmann "Technical guides for heat pumps".

Minimum clearances



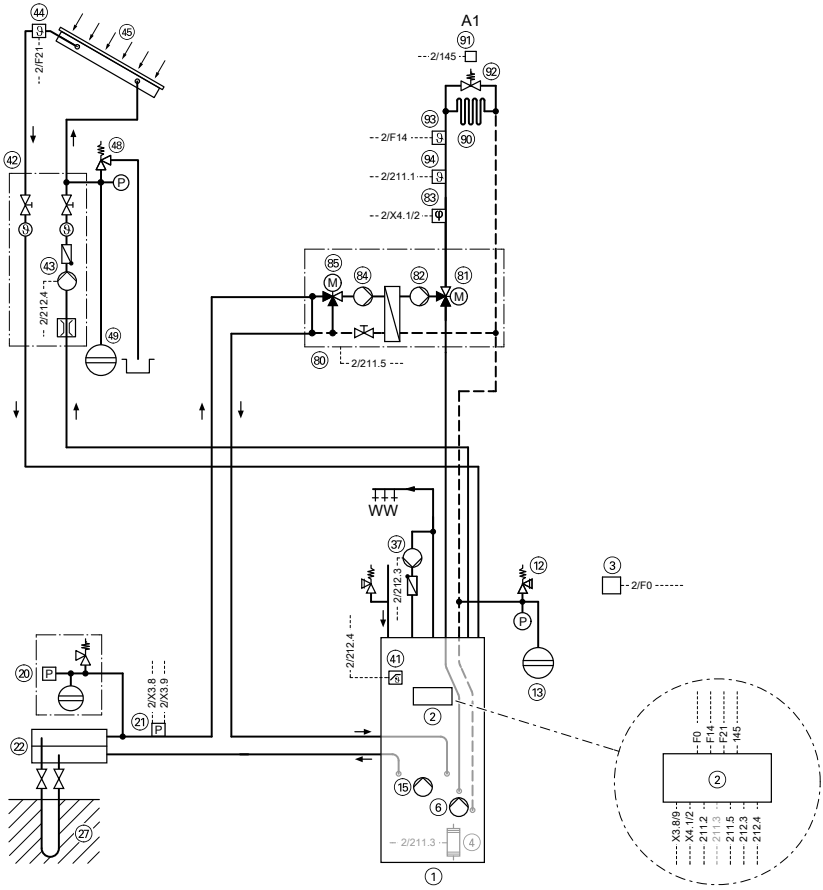
System example

Select system scheme 2 (see page 78)

- 1 underfloor heating circuit **without** mixer (A1)
- DHW heating with integral DHW cylinder
- Option:
  DHW heating with a solar thermal system

Note
This scheme is a basic example without shut-off valves or safety equipment. This does not replace the local technical engineering task.

System example (cont.)



Explanation of the designation of electrical contacts

Example:
"2/211.2" at pos. (94) Secondary pump connection via temperature limiter as maximum temperature limiter for underfloor heating (in series):
The temperature limiter is connected to pos. (2) (control unit) **/** terminal strip 211 **.** Terminal 2
For further details regarding the electrical connections, see chapter "Overview of PCBs and connection options" from page 119.

System example (cont.)

Pos.	Description
	Heat source
①	Compact heat pump
②	Heat pump control unit
③	Outside temperature sensor
④	Instantaneous heating water heater, 9 kW (accessory)
⑥	Secondary pump
⑫	Safety equipment block with safety assembly
⑬	Expansion vessel
⑮	Primary pump
	Primary circuit
⑳	Brine accessory pack
㉑	Pressure switch, primary circuit
㉒	Brine distributor for geothermal probes/geothermal collectors
㉗	Geothermal probe/geothermal collector
	DHW heating
㊲	DHW circulation pump (accessory)
	DHW heating with solar
㊶	High limit safety cut-out (max. 95 °C) for DHW cylinders (on site)
㊷	Solar-Divicon
㊸	Solar circuit pump R1
㊹	Collector temperature sensor KOL (Vitosolic standard delivery)
㊺	Solar collector
㊽	Safety equipment block with safety assembly
㊾	Expansion vessel
	Natural cooling function (NC)
㊿	NC-Box with mixer
(81)	Mixer motor NC-Box
(82)	Secondary cooling circuit pump
(83)	Contact humidistat
(84)	Primary cooling circuit pump
(85)	Mixer motor
	Direct heating circuit A1
(90)	Underfloor heating circuit
(91)	Vitotrol 200 remote control (accessory)
(92)	Overflow valve
(93)	Flow temperature sensor
(94)	Temperature limiter for limiting the maximum temperature of underfloor heating systems

System example (cont.)

Required parameters

Parameter	Setting
"System definition"	
■ "System scheme 7000"	**"2"**
"Cooling"	
■ "Cooling 7100"	**"1"**
■ "Cooling circuit 7101"	**"1"**
"Solar"	
■ "Solar control unit type 7A00"	**"4"**
For accessories (if installed):	
DHW circulation pump	Set switching times (see operating instructions)
"Heating circuit A1"	
■ "Remote control 2003"	**"1"**
"Electric heater"	
■ "Inst.htg.water heat 7900"	**"1"**

Opening and separating the heat pump

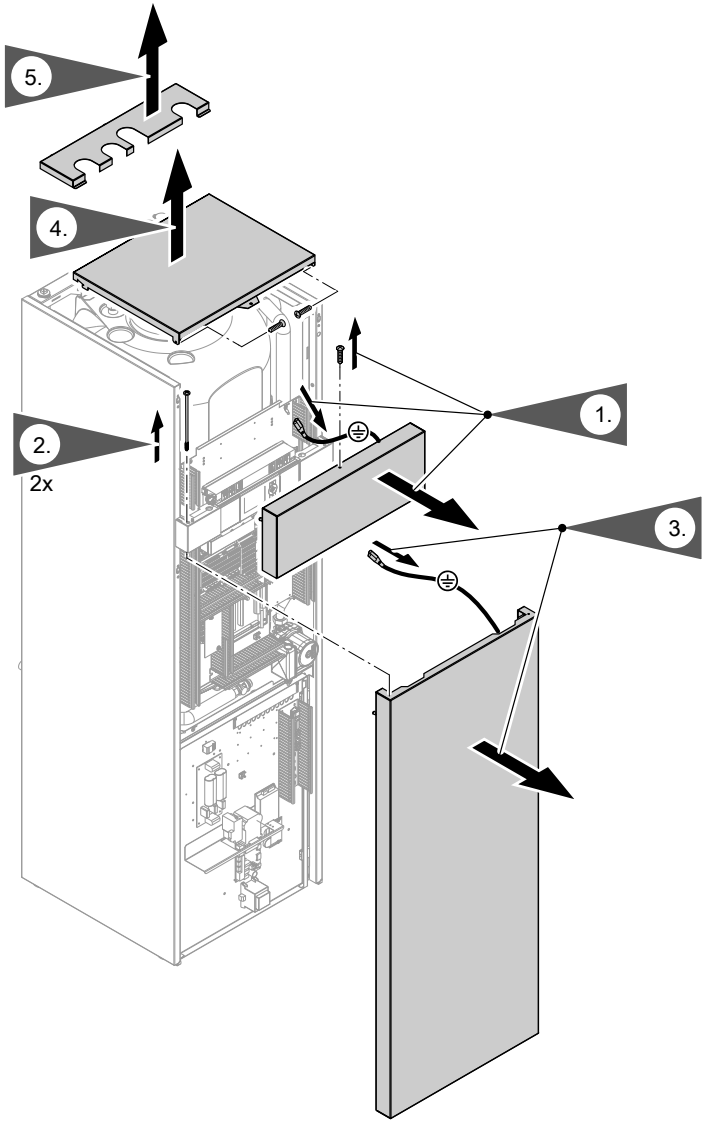
During handling, the cylinder module can be removed (see page 13 onwards). In addition, the heat pump module can be removed (see page 18).

! **Please note**
Avoid damaging the appliance during handling.
Never put weight on the top, front or side panels of the appliance.

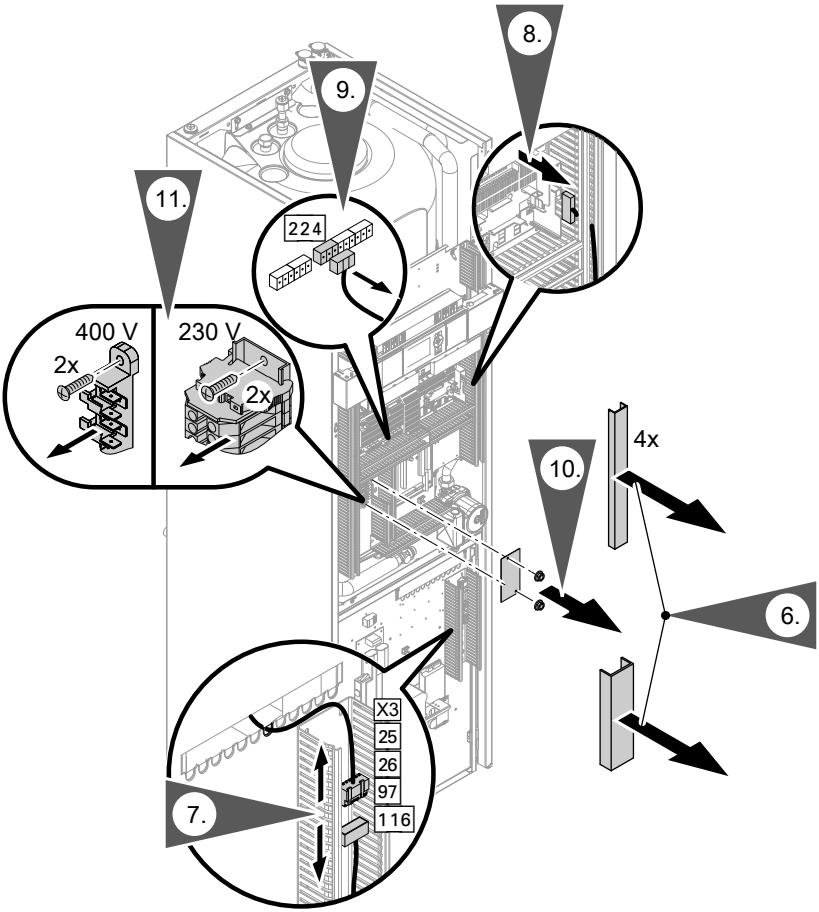
! **Please note**
Installing a compressor at a steep angle inside the heat pump can result in equipment damage.
Never tilt the heat pump more than 45° during handling and installation.

Opening and separating the heat pump (cont.)

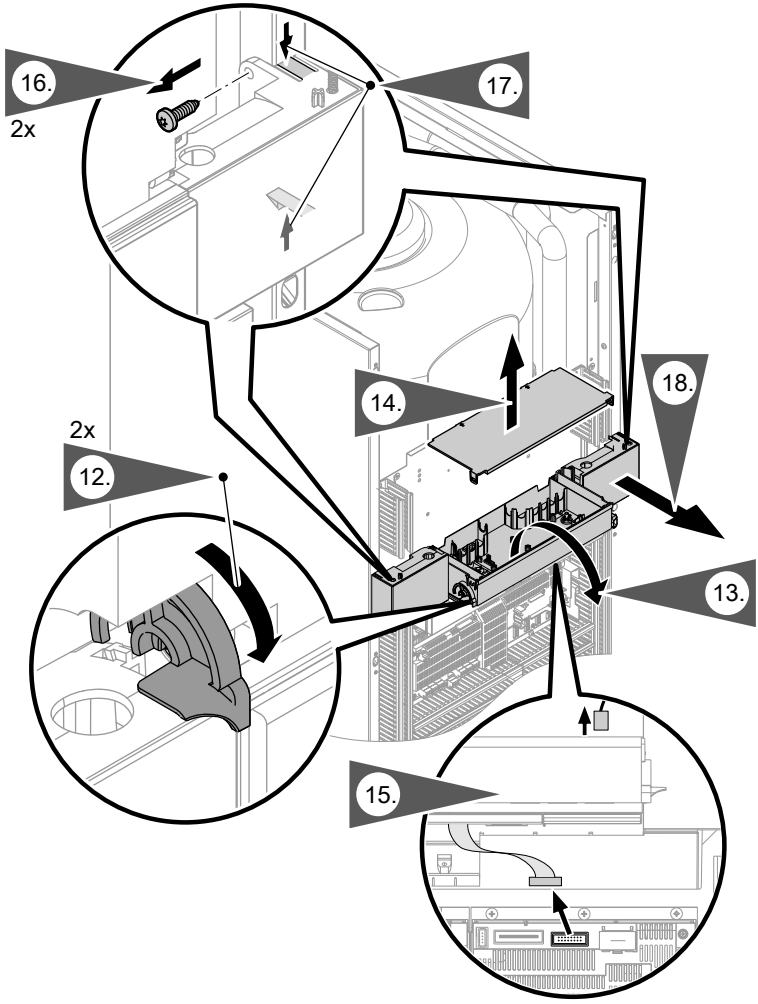
Removing the cylinder module



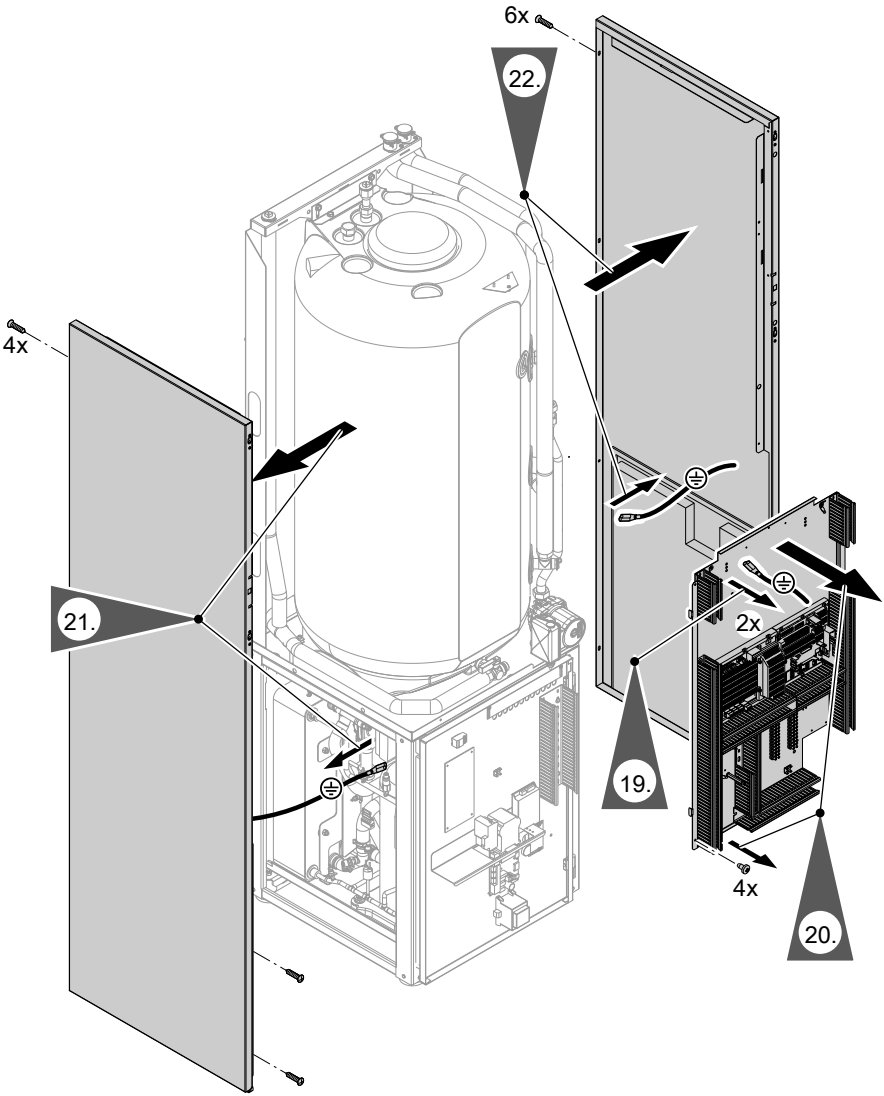
Opening and separating the heat pump (cont.)



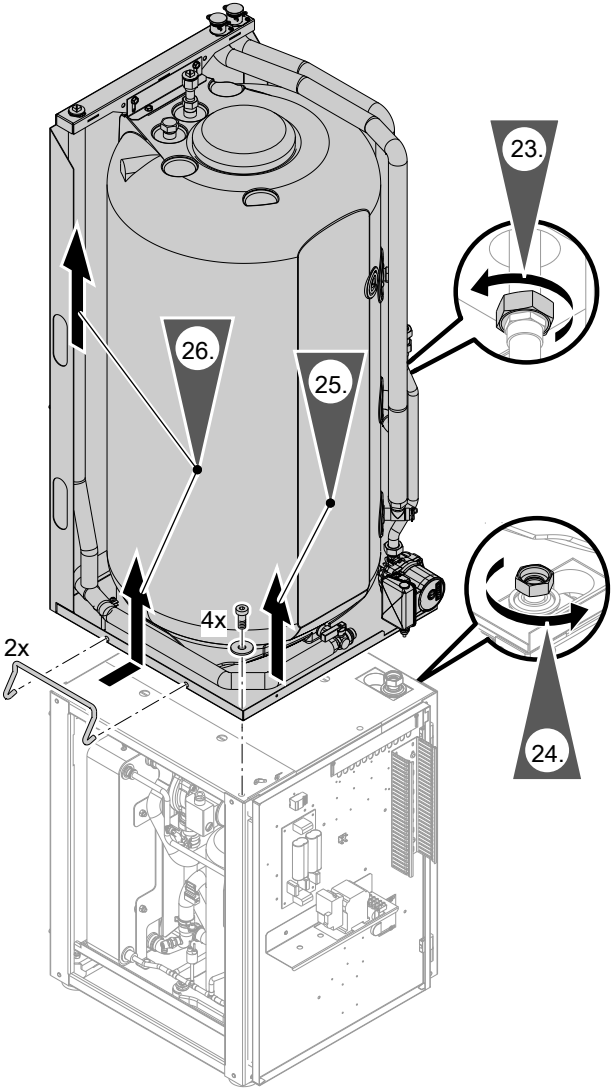
Opening and separating the heat pump (cont.)



Opening and separating the heat pump (cont.)

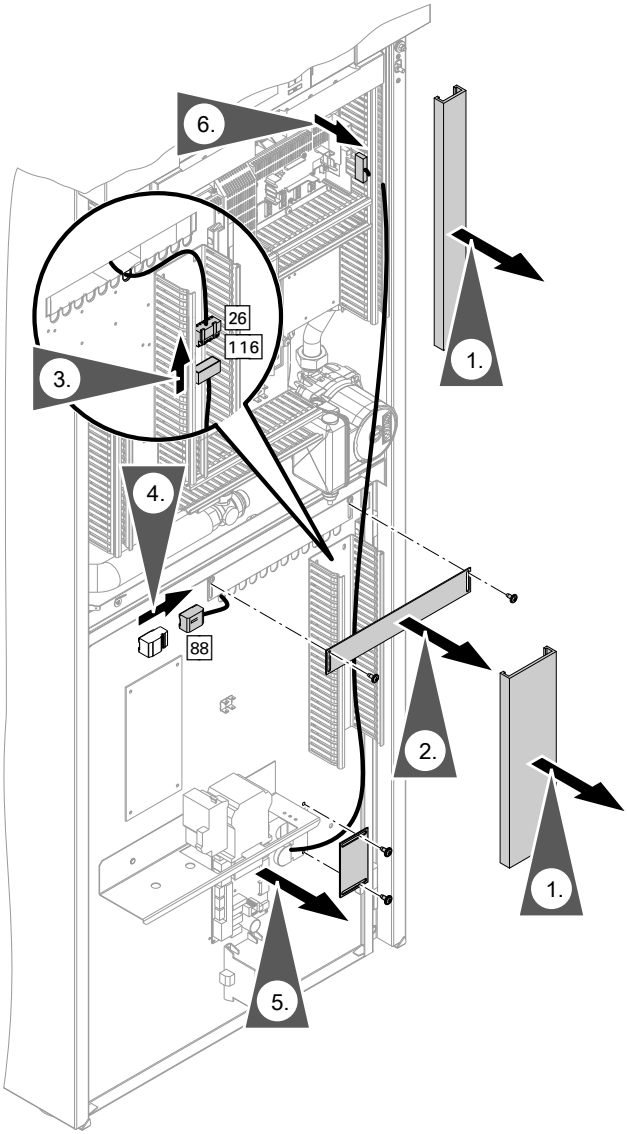


Opening and separating the heat pump (cont.)

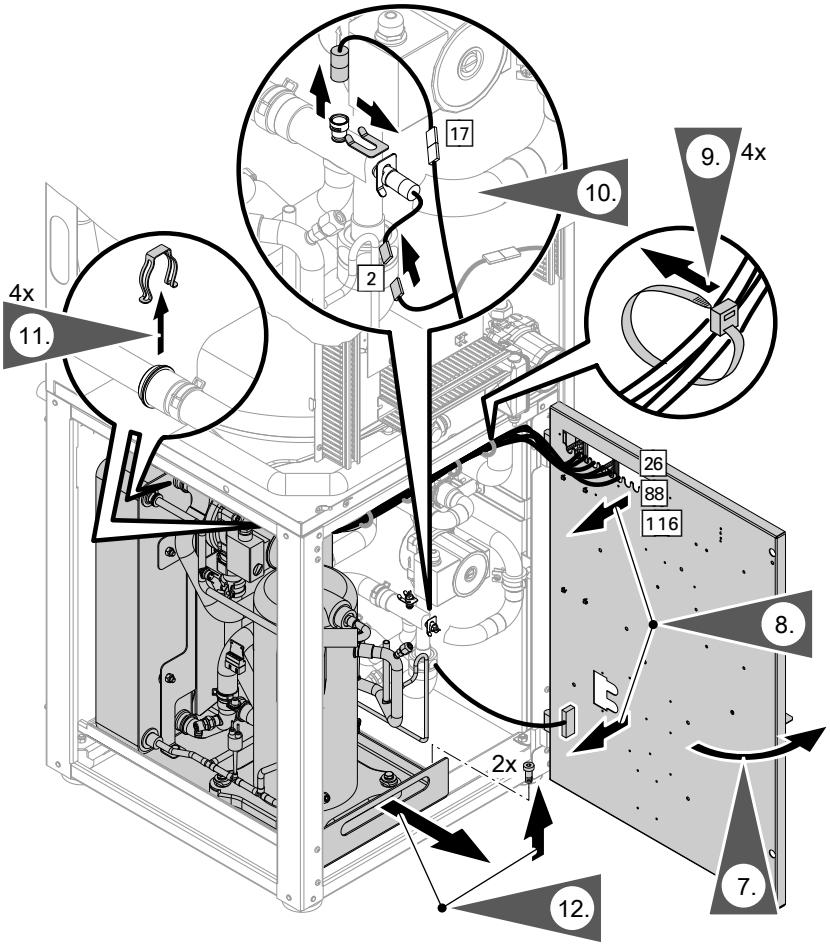


Opening and separating the heat pump (cont.)

Removing the heat pump module

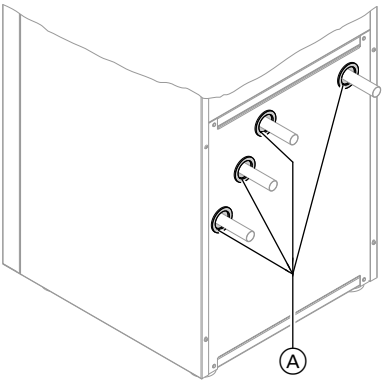


Opening and separating the heat pump (cont.)



Opening and separating the heat pump (cont.)

Assembly and sealing faces to note



1. Install the heat pump module in reverse order to that described on page 18.
   With pipe outlets, ensure pipe glands Ⓐ are seated correctly.
   Seal pipe glands Ⓐ with adhesive tape.

2. Fit the cylinder module in reverse order to that described on page 13.

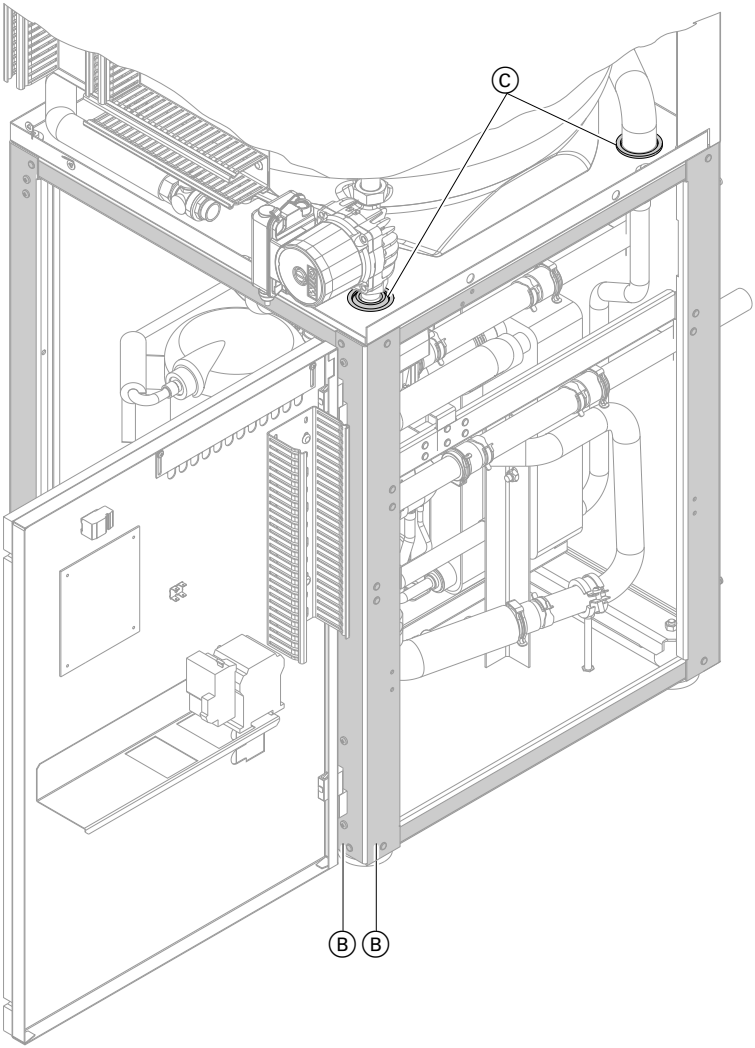
! **Please note**
Make tight hydraulic connections between the heat pump and cylinder modules.
With pipe outlets, ensure pipe glands Ⓒ are seated correctly (see the following diagram).

! **Please note**
To prevent the formation of condensate and extreme noise development, tightly seal the control unit door.

Note
Because of the sound insulating mat, the control unit door stands out slightly when closed.

! **Please note**
Seal the appliance to be soundproof and diffusion-proof.
Sealing tape on the side panels must be in close contact with sealing faces Ⓑ on the casing.

Opening and separating the heat pump (cont.)



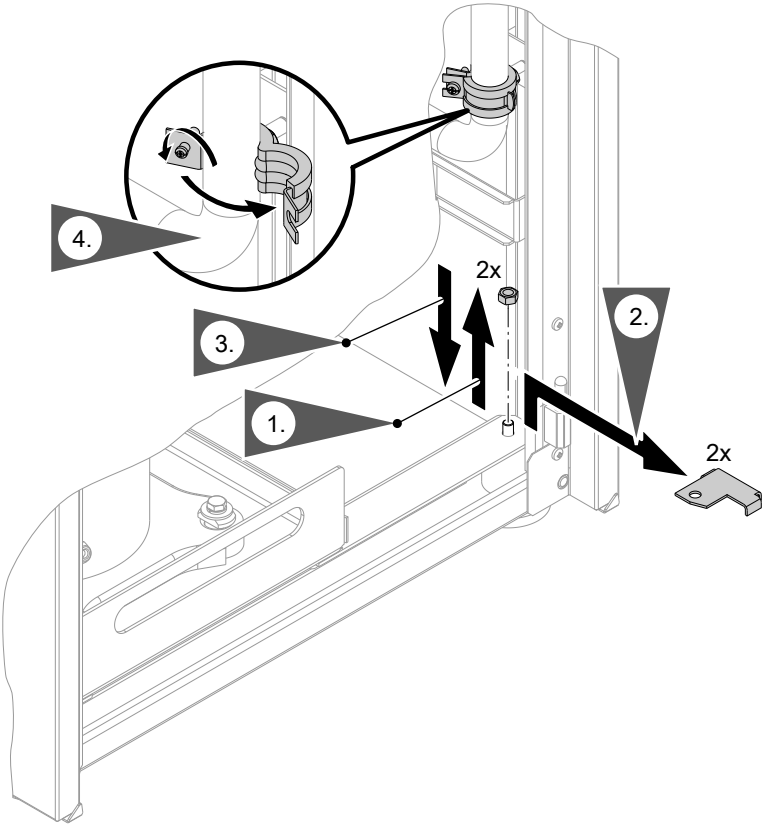
Installing the heat pump

Install the heat pump according to the details on page 8.

Installing the heat pump (cont.)

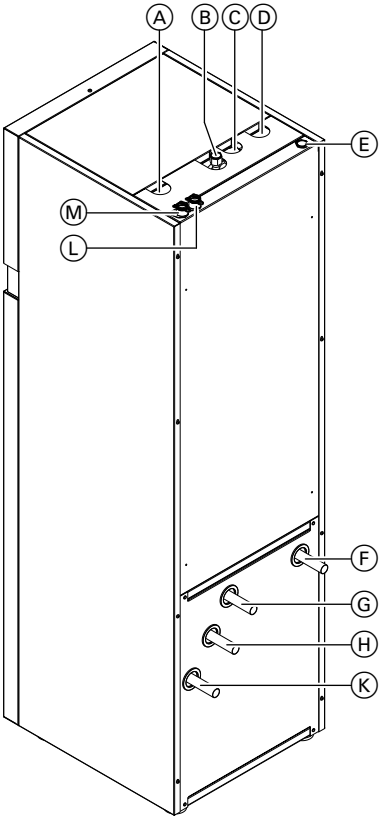
Removing the transport brackets

! **Please note**
If transport brackets are not removed, they cause vibrations and excessive development of noise.



Hydraulic connections

Overview of connections



- Ⓐ Entry for low voltage cables < 42 V
- Ⓑ DHW
- Ⓒ DHW circulation
- Ⓓ Entry for 230 V cables
- Ⓔ Cold water
- Ⓕ Primary circuit return (heat pump brine outlet)
- Ⓖ Primary circuit flow (heat pump brine inlet)
- Ⓗ Heating water flow
- Ⓚ Heating water return
- Ⓛ Solar circuit return
- Ⓜ Solar circuit flow

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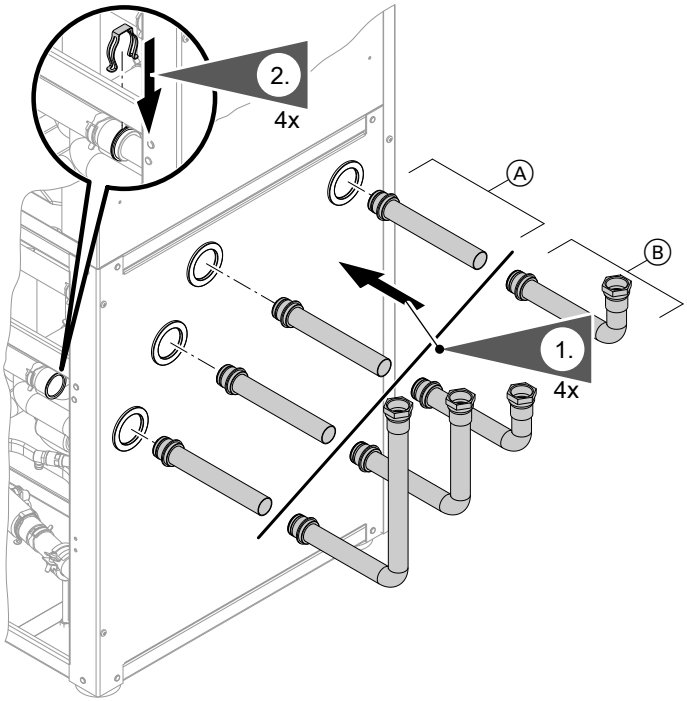
Hydraulic connections (cont.)

Connecting the primary/secondary circuit



Ⓐ Straight pipe sections supplied
Ⓑ Pipe bends from connection set primary/secondary circuit (accessories, see separate installation instructions)

Connecting the primary circuit

! **Please note**
The components used must be resistant to the heat transfer medium.
Never use zinc-plated/galvanised pipes.

1. Equip the primary circuit with an expansion vessel and safety valve (in accordance with DIN 4757).

Hydraulic connections (cont.)

Note

- *Expansion vessel must be approved to DIN 4807. Diaphragms of expansion vessel and safety valve must be suitable for the heat transfer medium.*
- *Blow-off and drain lines must converge in one container that can hold the maximum possible expansion volume of the heat transfer medium.*

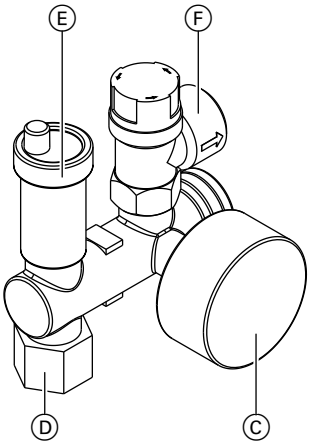
2. Ensure adequate thermal and sound insulation of all pipes routed through walls.

3. Insulate lines inside the building to provide protection from heat and vapour diffusion.

4. Connect primary lines to heat pump:
With straight pipe sections supplied
or
With connection set primary/secondary circuit (accessory set with angled pipe sections)

Connection set installation instructions

Connecting the secondary circuit



Safety assembly supplied

Ⓒ Pressure gauge
Ⓓ Connection G 1"
Ⓔ Quick-action air vent valve
Ⓕ Safety valve

1. Connect secondary lines to heat pump:

Please note
Make tight hydraulic connections on the primary and secondary sides.
With pipe outlets, ensure pipe glands are seated correctly (if necessary, seal with sealing tape; see page 20).

Hydraulic connections (cont.)

2. Install the safety assembly provided:
   Either to the on-site line in the heating water return
   or
   To the connection set primary circuit/ secondary circuit (accessories)

   Connection set installation instructions

3. Fill and vent secondary circuit.

4. Thermally insulate pipes inside the building.

Note

- *In underfloor heating circuits, integrate a temperature limiter on site for limiting the maximum temperature of underfloor heating systems.*
- *Safeguard minimum flow rate, e.g. with overflow valve (see Specification on page 141).*
- *Equip the secondary circuit on site with an expansion vessel.*

Connecting the solar circuit

Connect the solar circuit on site.

Electrical connections

For further information, an overview of the electrical connections and more details regarding the PCBs, see page 119 onwards.

Danger
Damaged cable insulation can cause injury and damage to the appliance.
Route cables so that they cannot touch very hot, vibrating or sharp-edged components.

Danger
Incorrectly routed wiring can lead to serious injury from electrical current and result in equipment damage.

- Route 230 V cables and LV cables separately.
- Strip the insulation from the cables as close to the terminals as possible, and bundle tightly to the associated terminals.
- Secure cables with cable ties.

This ensures that, in case of failure, for example when detaching a wire, the wires cannot drift into the adjacent voltage area.

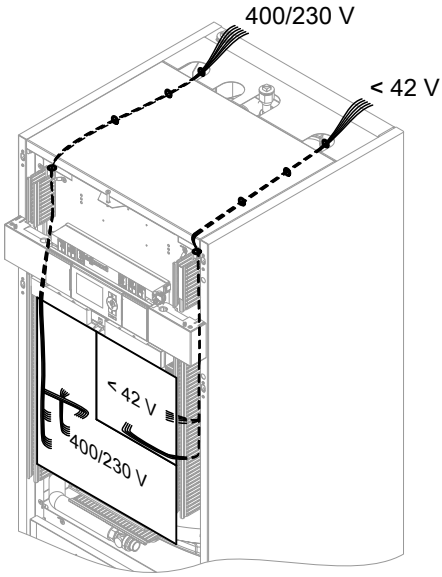
Electrical connections (cont.)

Required cable lengths:

400/230 V~	1700 mm plus wall clearance
< 42 V	1500 mm plus wall clearance

Note

The 400/230 V~ compressor power supply is protected against contact with a contact shield. This contact shield can be sealed for power-OFF (if required) (see page 31).



Note

High wall outlet for electrical cables: 2100 mm (see "Technical guides for heat pumps")

Power supply

Danger
Incorrectly executed electrical installations can lead to injury from electrical current and result in equipment damage.

Make the power supply connection and implement all earthing measures (e.g. RCD circuit) in accordance with the following regulations:
- IEC 60364-4-41
- VDE requirements
- Requirements specified by your local power supply utility
- Protect the power cable to the control unit with no more than 16 A.

Danger
The absence of component earthing in the system can lead to serious injury from electrical current if an electrical fault occurs. The equipment and the pipework must be connected to the earth bonding of the house in question.

Isolator for non-earthed conductors
- The main isolator (if installed) must simultaneously isolate all non-earthed conductors from the mains with a minimum contact separation of 3 mm.
- If **no** main isolator is installed, all non-earthed cables must be isolated from the mains by the upstream breaker with at least 3 mm contact separation.

Danger
Incorrect core termination can cause severe injuries and damage to the equipment.
Never interchange cores "L" and "N".

Power supply (cont.)

General information regarding the power supply

Information regarding the compressor power supply

■ **Please note**
An incorrect phase sequence can cause damage to the unit. Make the compressor power supply **only** in the phase sequence specified (see terminal) with a **clockwise** rotating field.

■ If full wave soft starter is installed (see type plate), the compressor power fuses must have Z characteristics.
■ If compressor and/or instantaneous heating water heater (accessory) are operated at a lower tariff (power-OFF), provide an additional cable (e.g. NYM 3 x 1.5 mm^2) for the power-OFF signal from the distribution board (meter box) to the control unit.

Information regarding the control unit power supply

■ Protect the power supply to the control unit with no more than 16 A.
■ For accessories and external components which are not to be connected to the control unit, we recommend making the power connection to the same fuse, but with at least the same phase as the control unit.
Connection to the same fuse/MCB provides additional safety when the power is switched off. Observe the power consumption of the consumers connected (see page 141).
■ The power supply to the control unit (3 x 1.5 mm^2) and the cable for the power-OFF signal can be combined in a five-core cable. Observe the technical connection requirements of the power supply utility.

Information regarding the power supply utility

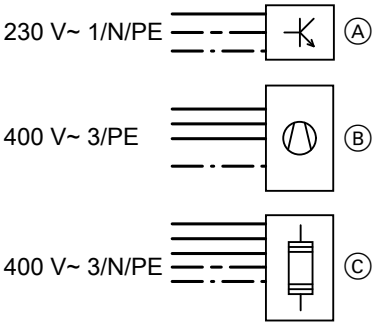
■ In negotiations with your power supply utility, different supply tariffs for the main power circuits may be offered.
■ The **control unit/electronics** feed must be implemented **without** possible blocking from the power supply utility; tariffs that are subject to possible shutdowns must not be applied to these feeds.
■ The allocation of the power-OFF (for compressor and/or instantaneous heating water heater) is made via the type of connection and by a setting in the control unit (see pages 31 and 97). In Germany, the power supply can be cut off for up to 3 x 2 hours within any 24 h period.

Power supply (cont.)

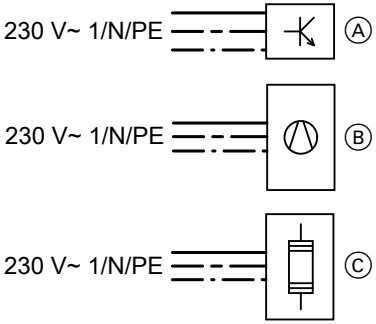
Power cables

The power supply is separated into three areas with three power cables:

Vitocal 242-G, 400 V~

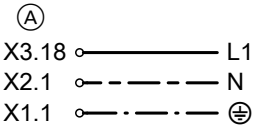


Vitocal 242-G, 230 V~



Ⓐ Control unit power supply
Ⓑ Compressor power supply
Ⓒ Power supply to instantaneous heating water heater (accessory; see separate installation instructions)

Control unit power supply (230 V~)



Ⓐ Mains terminals on the 3 rows of screw terminals (see page 125)

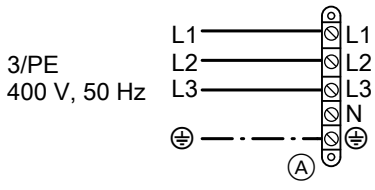
Note
*This supply must **never** be blocked.*

- Max. fuse rating 16 A
- Standard tariff (no optional low tariff with power-OFF)
- Recommended cable: 3 x 1.5 mm^2

Power supply (cont.)

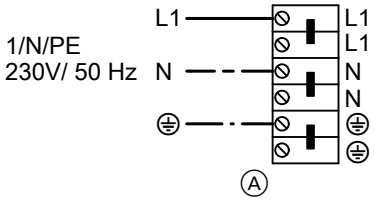
Compressor power supply (400/230 V~)

Vitocal 242-G, 400 V~



Ⓐ Compressor mains terminals behind contact shield (see page 119).

Vitocal 242-G, 230 V~



- Fuse protection in accordance with the compressor rating (see specification on page 141/type plate).
  For appliances with full wave soft starter, the upstream fuses must have Z characteristics.
- Low tariff and power-OFF can be used.
- No parameters need to be set when using low tariff with power-OFF. During the power-OFF period, the compressor is shut down.
- Recommended cable for the Vitocal 242-G, 400 V~: 5 x 2.5 mm^2
  Recommended cable for the Vitocal 242-G, 230 V~: 3 x 4 mm^2 for cable lengths up to 20 m; for cable lengths > 20 m, a larger cable cross-section is required.

Power supply with power-OFF

Power-OFF without on-site load disconnection

The power-OFF signal is connected directly in the control unit. The compressor is "forced" off when power-OFF is enabled.
Parameter **"Stage at power-OFF"** is used to determine whether and at what stage the instantaneous heating water heater (accessory) remains operational (see page 97).

Note
Observe the technical connection conditions of the relevant power supply utility.

Power supply (cont.)

Vitocal 242-G, 400 V~

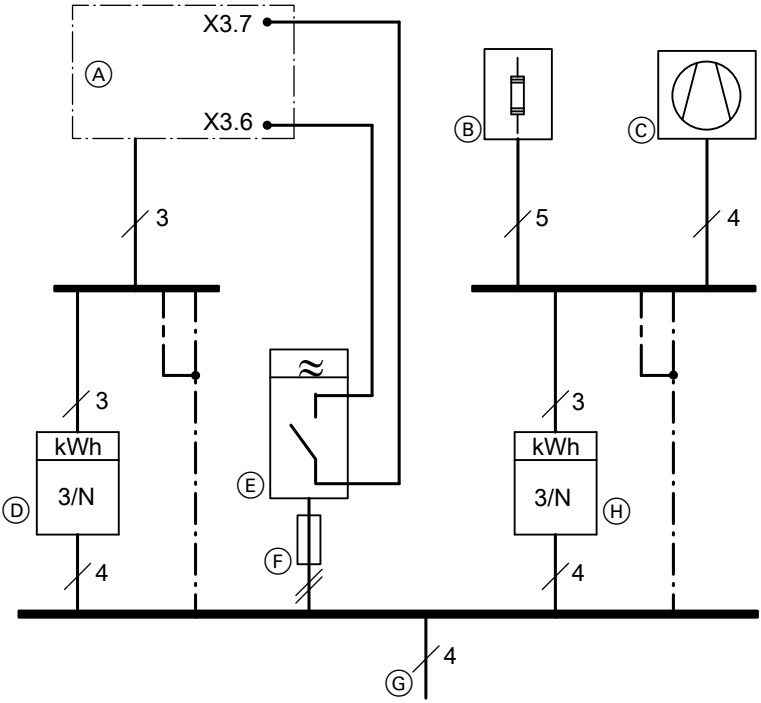


Diagram excluding fuses and RCD.

- Ⓐ Control unit (for connection to luster terminals, see page 125)
- Ⓑ Instantaneous heating water heater (accessory)
- Ⓒ Compressor
- Ⓓ High tariff meter
- Ⓔ Ripple control receiver (contact open: power-OFF enabled)
- Ⓕ Backup fuse ripple control receiver
- Ⓖ TNC system feed
- Ⓗ Low tariff meter

Power supply (cont.)

Vitocal 242-G, 230 V~

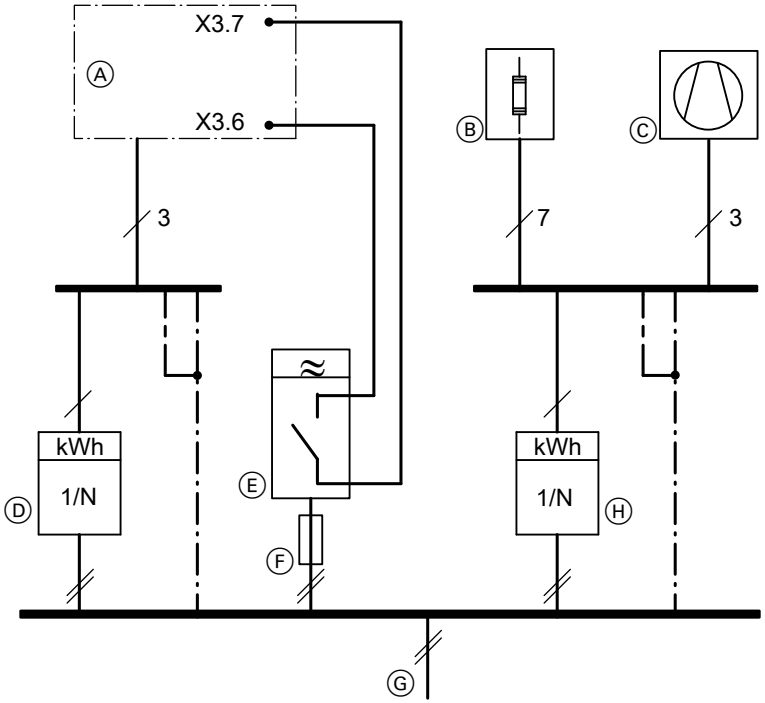


Diagram excluding fuses and RCD.

Ⓐ Control unit (for connection to luster terminals, see page 125)
Ⓑ Instantaneous heating water heater (accessory)
Ⓒ Compressor
Ⓓ High tariff meter
Ⓔ Ripple control receiver (contact open: power-OFF enabled)
Ⓕ Backup fuse ripple control receiver
Ⓖ TNC system feed
Ⓗ Low tariff meter

Power supply (cont.)

Power-OFF with on-site load disconnection

The power-OFF signal is connected to the on-site contactor of the low tariff power supply and in the control unit. The compressor **and** instantaneous heating water heater (accessory) are "forced" off when power-OFF is enabled.

Note

Observe the technical connection conditions of the relevant power supply utility.

Vitocal 242-G, 400 V~

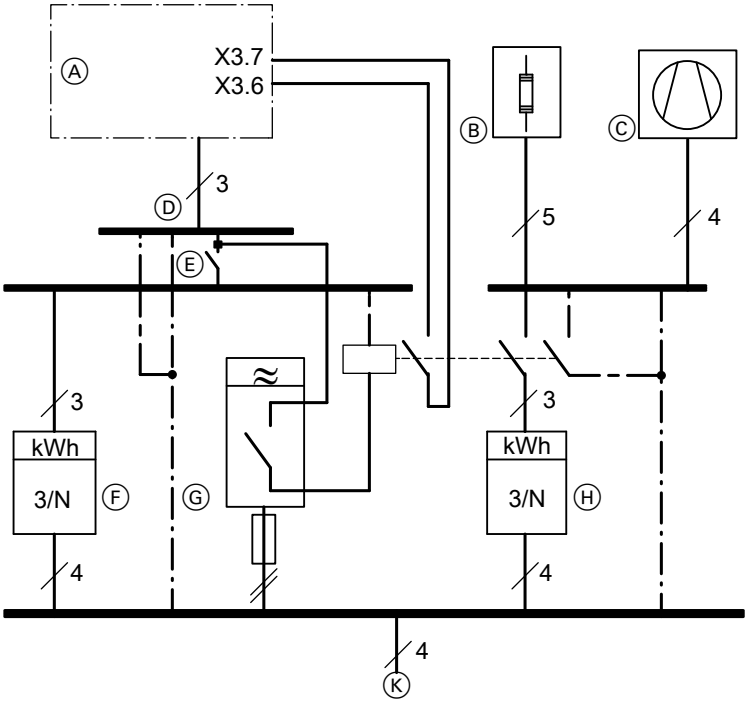


Diagram excluding fuses and RCD.

Ⓐ Control unit (for connection to luster terminals, see page 125)
Ⓑ Instantaneous heating water heater (accessory)
Ⓒ Compressor
Ⓓ Control unit power supply
Ⓔ Main isolator
Ⓕ High tariff meter

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Power supply (cont.)

Ⓖ Ripple control receiver (contact open: power-OFF enabled)
Ⓗ Low tariff meter
Ⓚ TNC system feed

Vitocal 242-G, 230 V~

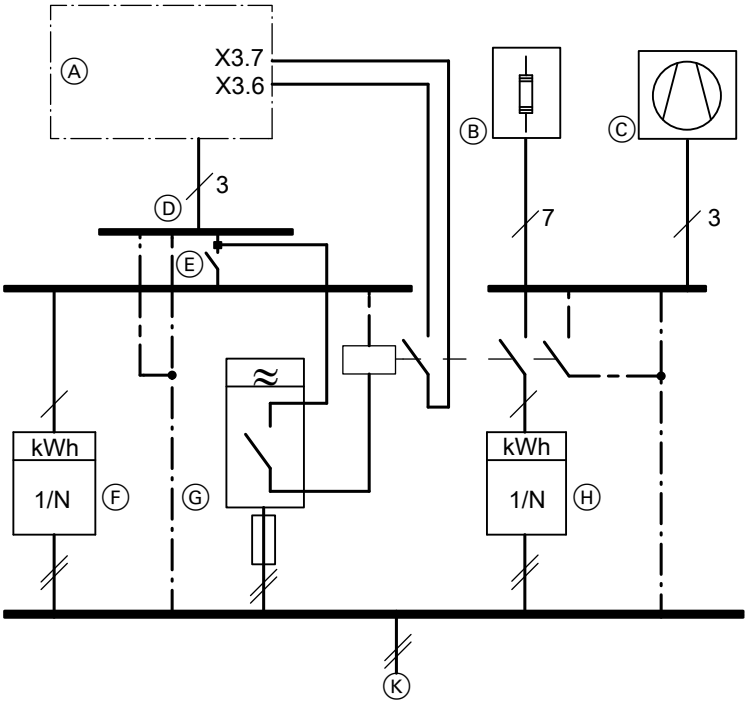

Diagram excluding fuses and RCD.

Ⓐ Control unit (for connection to luster terminals, see page 125)
Ⓑ Instantaneous heating water heater (accessory)
Ⓒ Compressor
Ⓓ Control unit power supply
Ⓔ Main isolator
Ⓕ High tariff meter
Ⓖ Ripple control receiver (contact open: power-OFF enabled)
Ⓗ Low tariff meter
Ⓚ TNC system feed

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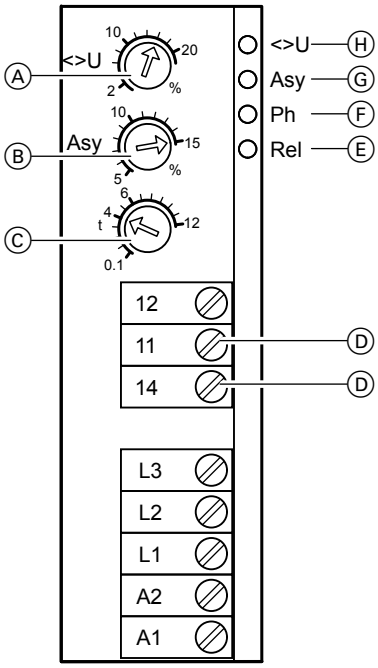
Power supply (cont.)

Phase monitor (accessory, 400 V~)

The phase monitor is used to monitor the mains power supply to the compressor. The following power supply deviations are permitted in the delivered condition:

Over/undervoltage	15 %
Phase asymmetry	15 %
Switching delay	4 s

The phase monitor switches off (switching contact opens) if these tolerances are exceeded.



Ⓐ Over/undervoltage in %
Ⓑ Phase asymmetry in %
Ⓒ Switching delay in s
Ⓓ Contact used in safety chain (N/O)
Ⓔ Operating display ("Rel")
Ⓕ Fault display phase failure/phase sequence ("Ph")
Ⓖ Fault display asymmetry ("Asy")
Ⓗ Fault display over/undervoltage ("<>U")

The phase monitor automatically re-enables the power supply if the values return to within the specified tolerance range. Remove the cause if the relay has responded. The relay does not need to be reset.

LEDs explained

- LED "Rel" illuminates green:
  All voltages and the rotating field (clockwise) are healthy.
- LED "Ph" illuminates red:
  The relay has responded; the rotating field is anti-clockwise.
- All LED's off:
  One or several phases have dropped out.
- LED "<>U" illuminates red:
  Incorrect voltage on one/several phase(s).
- LED "Asy" illuminates red:
  Asymmetry on one/several phase(s).

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Connecting to terminals X3.8/X3.9

After connecting the power supply, a connection **must** be made at terminals X3.8 and X3.9:

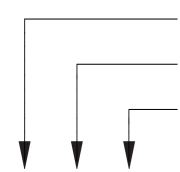
- Primary circuit pressure switch and/or frost stat
  or
- Jumper from the pack

Closing the heat pump

See page 20.

Steps - commissioning, inspection and maintenance

For further information regarding the individual steps, see the page indicated



				Page
•			**1. Writing reports**	39
•	•	•	**2. Checking the refrigeration circuit for leaks**	39
•			**3. Filling and venting on the primary side**	39
•			**4. Filling and venting on the secondary side**	39
•			**5. Filling and venting the solar circuit**	40
•	•	•	**6. Checking the expansion vessel and the heating circuit pressure**	41
		•	**7. Cleaning the DHW cylinder**	41
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•			**9. Commissioning assistant**	43
•			**10. Instructing the system user**	46

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Further details regarding the individual steps

Writing reports

Enter measurements taken during commissioning (described in the following) into the reports from page 137 onwards.

Checking the refrigeration circuit for leaks

If there are any leaks, have the compact heat pump checked by a refrigeration engineer.

Filling and venting on the primary side

Please note
To prevent equipment damage, fill the primary circuit before connecting the power supply.

1. Check the pre-charge pressure of the expansion vessel (see page 41).
2. Fill the primary circuit with Viessmann heat transfer medium and vent.

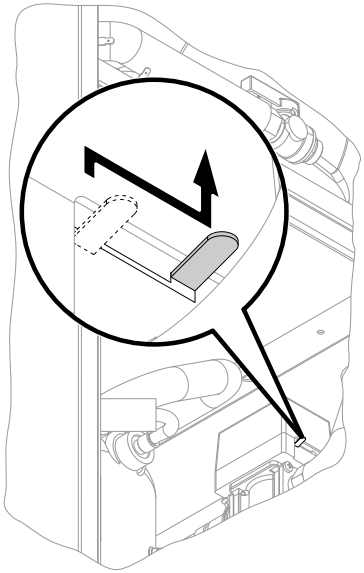
   Note
   The system must be protected against frost down to –15 °C.
3. Check the connections for possible leaks. Replace faulty or displaced gaskets.

Filling and venting on the secondary side

Please note
To prevent equipment damage, protect electrical components on the control unit door from escaping liquids.

1. Open any on-site non-return valves installed.

Further details regarding the individual steps (cont.)



2. Check the pre-charge pressure of the expansion vessel (see page 41).

3. Fill (flush) and vent secondary circuit:
   - Slightly open quick-action air vent valve (see safety assembly on page 25) (remains open).
   - To vent, move hand lever of three-way diverter valve for heating/ DHW into its centre position (see adjacent diagram).

4. **Please note**
   To prevent equipment damage, check the flow and return connections of the secondary heat pump circuit for **leaks**. In case of leaks, immediately shut off the equipment, drain the water and check the seating of the seal rings. Replace all seal rings that may have become dislodged.

5. Check the system pressure and top up with water if required.
   Minimum system pressure: 0.8 bar
   Permissible operating pressure: 3 bar

Filling and venting the solar circuit

Danger
Overheated collector areas and overheated heat transfer medium can cause burns/scalding and equipment damage.
When working on the collector and the solar circuit with heat transfer medium, protect the collector areas against solar irradiation.

1. Check the pre-charge pressure of the diaphragm expansion vessel.

2. **Please note**
   To prevent equipment damage, only fill the solar circuit with Tyfocor LS.

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Further details regarding the individual steps (cont.)

3. Vent the solar circuit.
Minimum system pressure: 1.7 bar

Permissible operating pressure:
6 bar

Checking the expansion vessel and the heating circuit pressure

Observe design information.
Vitocal technical guide

Cleaning the DHW cylinder

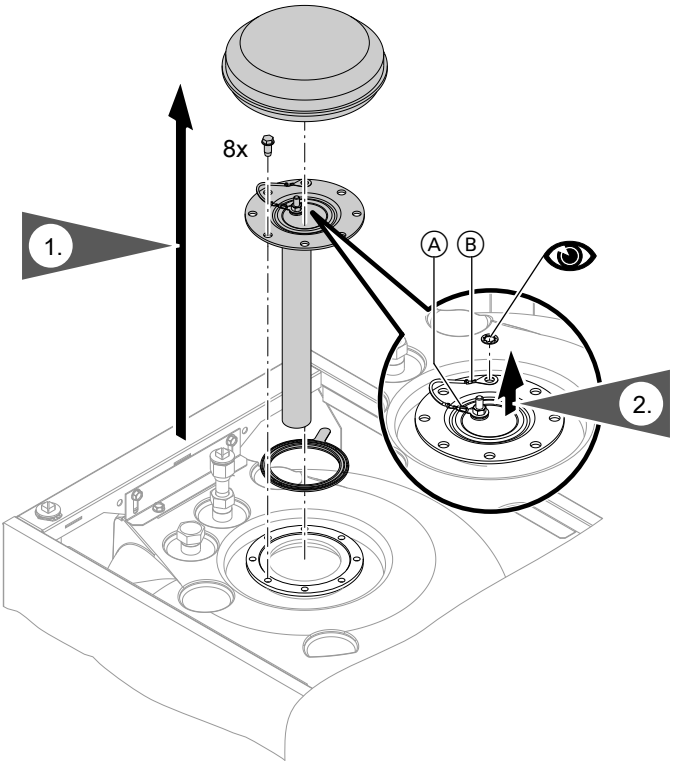
Danger
DHW or heat transfer medium escaping uncontrollably can lead to scalding and building damage.
Only open DHW and heating water connections with an depressurised DHW cylinder.

Please note
Negative pressure in the DHW cylinder can lead to material damage.
The air vent valve must always be open when draining with a vacuum pump.

Please note
Pointed or sharp cleaning objects may damage the DHW cylinder.

Please note
Cleaning agents containing hydrochloric acid attack the material of the DHW cylinder.

Further details regarding the individual steps (cont.)



Please note
A short circuit between magnesium anode and internal indirect coil increases the protective effect of the magnesium anode and leads to corrosion damage on the DHW cylinder.
Before inserting the electrical cables, measure the resistance between terminals Ⓐ and Ⓑ. If the resistance is significantly smaller than infinite, check whether the magnesium anode is touching the internal indirect coil.

Further details regarding the individual steps (cont.)

Replacing the magnesium anode

For removing the magnesium anode, see page 41.

Please note
A short circuit between magnesium anode and internal indirect coil increases the protective effect of the magnesium anode and leads to corrosion damage on the DHW cylinder.
Before inserting the electrical cables, measure the resistance between terminals Ⓐ and Ⓑ (see previous diagram). If the resistance is significantly smaller than infinite, check whether the magnesium anode is touching the internal indirect coil.

Commissioning assistant

The commissioning assistant guides you automatically through all the menus where settings have to be made.

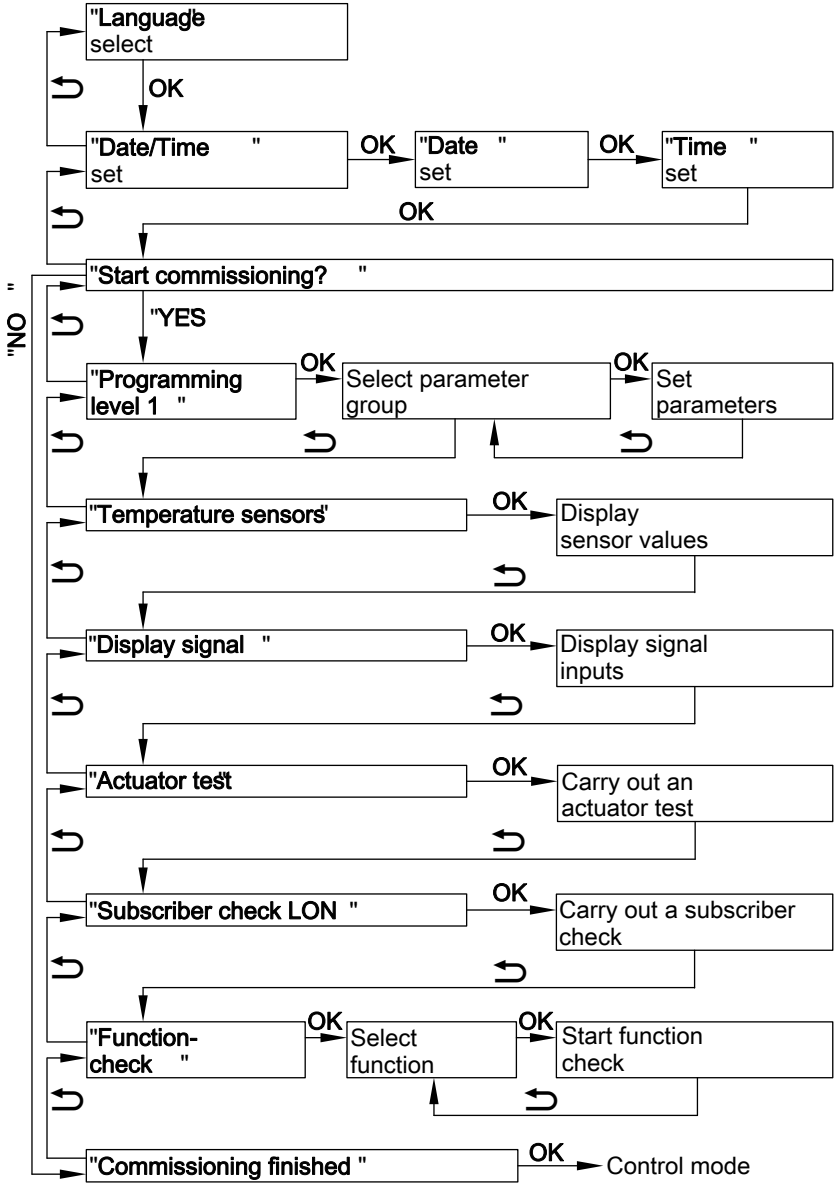
Please note
Incorrect operation at "**Coding level 1**" can result in damage to the appliance and heating system.
Always observe the installation and service instructions; failure to observe these will void your warranty rights.

Note
- *The scan **"Start commissioning assistant?" only** appears during initial commissioning.*
- *The configuration, parameter settings and function check can also be carried out without the commissioning assistant (see page 76, separate menu structure and operating instructions).*
- *When the unit is first commissioned, the display is in German:*

Further details regarding the individual steps (cont.)

- *Messages are displayed by manually controlling some components during commissioning. These do not indicate appliance faults.*

Further details regarding the individual steps (cont.)



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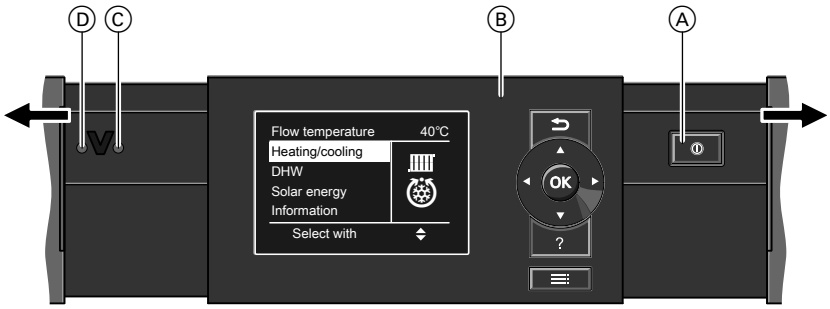
Further details regarding the individual steps (cont.)

Instructing the system user

The system installer must hand the operating instructions to the system user and instruct him/her in the operation of the system.

Messages

Scanning messages



Ⓐ ON/OFF switch
Ⓑ Programming unit
Ⓒ ON indicator (green)
Ⓓ Fault indicator ϟ (red)

If messages are pending, the message symbol flashes (⚠, △, ◁). For faults (⚠), fault indictator Ⓓ also flashes. Show the message text and message code by pressing **OK** (see "Message overview").

Explanation of messages

Fault "⚠"
- The central fault message terminal is activated.
- Message via communication facility (e.g. Vitodata, Vitocom) possible.
- The system is no longer in standard mode; the fault must be removed **as quickly as possible**.

Warning "△"
- The operation of the appliance is limited and the cause of the warning must be removed.

Note "◁"
- The appliance retains its functionality, however the information needs to be noted.

Acknowledging messages and recalling acknowledged messages

Operating instructions

Messages (cont.)

Calling up messages from the message history

- Messages cannot be acknowledged in the message history.
- The messages are listed in order of occurrence with the most recent first.
- Up to 30 entries are stored.

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Message history"**
3. Press **OK** to scan information about the required message.

Note
The service menu remains active until it is deactivated with ***"Terminate service?"****, or if no operation takes place for 30 minutes.*

Message overview

All messages are identified by a two-digit code.

Message		
System characteristics	**Cause**	**Measures**
02 Std after data error		
	Delivered condition set after recognition of data fault	Reconfigure system.
03 Configuration fault		
	System configuration fault: ■ Incorrect system scheme (contains non-supported heating circuit) ■ Max. flow temperature for heating circuit < min. flow temperature for cooling the heating circuit ■ Cooling for unavailable heating circuit	Check and match associated parameters, reset to delivered condition if required (**"Reset"**, see operating instructions), and reconfigure system. Contact your local heating contractor if the cause of the fault cannot be remedied.

Messages (cont.)

Message System characteristics	Cause	Measures
10 Outside temp sensor Operation with outside temperature -40 °C	Short circuit, outside temperature sensor	Check resistance (Ni 500) at plug-in connection F0; replace sensor if required.
18 Outside temp sensor Operation with outside temperature -40 °C	Lead break, outside temperature sensor	Check resistance (Ni 500) at plug-in connection F0; replace sensor if required.
20 Flow sensor secondary Operation with temperature value of return temperature sensor in secondary circuit, plus 5 K. If both temperature sensors (secondary flow and return) are faulty, the heat pump stops (message A9)	Short circuit, secondary circuit flow temperature sensor	Check resistance (Pt 500) at plug-in connection F8 and terminals X5.8/X5.9; replace sensor if required.
21 Return sensor sec. Operation with temperature value of flow temperature sensor in secondary circuit, minus 5 K. If both temperature sensors (secondary flow and return) are faulty, the heat pump stops (message A9)	Short circuit, secondary circuit return temperature sensor	Check resistance (Pt 500) at plug-in connection F9 and terminals X5.10/ X5.11; replace sensor if required.
28 Flow sensor secondary Operation with temperature value of return temperature sensor in secondary circuit, plus 5 K. If both temperature sensors (secondary flow and return) are faulty, the heat pump stops (message A9)	Lead break, secondary circuit flow temperature sensor	Check resistance (Pt 500) at plug-in connection F8 and terminals X5.8/X5.9; replace sensor if required.

Messages (cont.)

Message System characteristics	Cause	Measures
29 Return sensor sec.		
Operation with temperature value of flow temperature sensor in secondary circuit, minus 5 K. If both temperature sensors (secondary flow and return) are faulty, the heat pump stops (message A9)	Break, secondary circuit return temperature sensor	Check resistance (Pt 500) at plug-in connection F9 and terminals X5.10/ X5.11; replace sensor if required.
30 Flow sensor primary		
Operation with temperature value of return temperature sensor in primary circuit, plus 3 K. If both temperature sensors (primary flow and return) are faulty, the heat pump stops (message A9)	Short circuit, primary circuit temperature sensor, brine inlet	Check resistance (Pt 500) at plug-in connection F2 and terminals X5.2/X5.3; replace sensor if required.
31 Return sensor primary		
Operation with temperature value of flow temperature sensor in primary circuit, minus 2 K. If both temperature sensors (primary flow and return) are faulty, the heat pump stops (message A9)	Short circuit, primary circuit temperature sensor, brine outlet	Check resistance (Pt 500) at plug-in connection F3 and terminals X5.4/X5.5; replace sensor if required.
38 Flow sensor primary		
Operation with temperature value of return temperature sensor in primary circuit, plus 3 K. If both temperature sensors (primary flow and return) are faulty, the heat pump stops (message A9)	Lead break, primary flow temperature sensor, (brine inlet)	Check resistance (Pt 500) at plug-in connection F2 and terminals X5.2/X5.3; replace sensor if required.

Messages (cont.)

Message System characteristics	Cause	Measures
39 Return sensor primary		
Operation with temperature value of flow temperature sensor in primary circuit, minus 2 K. If both temperature sensors (primary flow and return) are faulty, the heat pump stops (message A9)	Lead break, primary return temperature sensor (brine outlet)	Check resistance (Pt 500) at plug-in connection F3 and terminals X5.4/X5.5; replace sensor if required.
40 Flow sensor HC2		
Mixer heating circuit M2 is closed	Short circuit, flow temperature sensor in heating circuit with mixer M2	Check resistance (Ni 500) at extension kit connections for heating circuit with mixer; replace sensor if required.
43 Flow sensor system		
	Short circuit, system flow temperature sensor (downstream of heating water buffer cylinder)	Check resistance (Pt 500) at plug-in connection F13; replace sensor if required.
44 Flow sensor cooling		
	Short circuit, flow temperature sensor, cooling circuit	Check resistance (Ni 500) at plug-in connection F14; replace sensor if required.
48 Flow sensor HC2		
Mixer heating circuit M2 is closed	Lead break, flow temperature sensor in heating circuit with mixer M2	Check resistance (Ni 500) at extension kit connections for heating circuit with mixer; replace sensor if required.
4B Flow sensor system		
	Break, system flow temperature sensor (downstream of heating water buffer cylinder)	Check resistance (Pt 500) at plug-in connection F13; replace sensor if required.

Messages (cont.)

Message System characteristics	Cause	Measures
4C Flow sensor cooling		
	Break, flow temperature sensor, cooling circuit	Check resistance (Ni 500) at plug-in connection F14; replace sensor if required.
50 DHW sensor top		
DHW heating is blocked.	Short circuit, top cylinder temperature sensor	Check resistance (Pt 500) at plug-in connection F6 and terminals X6.2/X6.1; replace sensor if required.
54 DHW solar		
No heating of the DHW cylinder/primary store by the solar thermal system; solar circuit pump remains OFF.	Cylinder temperature sensor F6 shorted out	See Vitosolic service instructions.
58 DHW sensor top		
DHW heating is blocked.	Break, cylinder temperature sensor F6	Check resistance (Pt 500) at plug-in connection F6 and terminals X6.2/X6.1; replace sensor if required.
5C DHW solar		
No heating of the DHW cylinder/primary store by the solar thermal system; solar circuit pump remains OFF.	Lead break, cylinder temperature sensor	See Vitosolic service instructions.
60 Buffer cylinder sensor		
Buffer cylinder is heated once every hour. Heating stops according to set value of the return temperature sensor.	Short circuit, buffer cylinder temperature sensor	Check resistance (Pt 500) at plug-in connection F4 and terminals X5.6/X5.7; replace sensor if required.

Messages (cont.)

Message System characteristics	Cause	Measures
68 Buffer cylinder sensor		
Buffer cylinder is heated once every hour. Heating stops according to set value of the return temperature sensor.	Break, buffer cylinder temperature sensor	Check resistance (Pt 500) at plug-in connection F4 and terminals X5.6/X5.7; replace sensor if required.
70 Room sensor HC1		
■ No frost protection mode via room temperature sensor ■ No room temperature hook-up ■ No room temperature control	Short circuit, room temperature sensor heating circuit A1	Check remote control sensor and replace if required (see Vitotrol service instructions).
71 Room sensor HC2		
■ No frost protection mode via room temperature sensor ■ No room temperature hook-up ■ No room temperature control	Short circuit, room temperature sensor heating circuit M2	Check remote control sensor and replace if required (see Vitotrol service instructions).
73 Room sensor SKK		
	Short circuit, room temperature sensor, cooling circuit	Check resistance (type Ni 500) at plug-in connection F16; replace sensor if required.
78 Room sensor HC1		
■ No frost protection mode via room temperature sensor ■ No room temperature hook-up ■ No room temperature control	Break, room temperature sensor heating circuit A1	Check remote control sensor and replace if required (see Vitotrol service instructions).

Messages (cont.)

Message System characteristics	Cause	Measures
79 Room sensor HC2		
■ No frost protection mode via room temperature sensor ■ No room temperature hook-up ■ No room temperature control	Break, room temperature sensor heating circuit M2	Check remote control sensor and replace if required (see Vitotrol service instructions).
7B Room sensor SKK		
	Break, room temperature sensor, cooling circuit	Check resistance (type Ni 500) at plug-in connection F16; replace sensor if required.
92 Collector sensor		
	Collector temperature sensor shorted out.	Check resistance (Pt 500) at plug-in connection F21 and terminals X6.10/ X6.11; replace sensor if required. If the Vitosolic is connected, check the Vitosolic sensor (see Vitosolic service instructions).
93 Return sensor solar		
	Return temperature sensor short circuit	Check resistance (Pt 500) at plug-in connection F18 and terminals X6.6/X6.7; replace sensor if required. If the Vitosolic is connected, check the Vitosolic sensor (see Vitosolic service instructions).

Messages (cont.)

Message System characteristics	Cause	Measures
9A Collector sensor		
	Collector temperature sensor lead broken	Check resistance (Pt 500) at plug-in connection F21 and terminals X6.10/ X6.11; replace sensor if required. If the Vitosolic is connected, check the Vitosolic sensor (see Vitosolic service instructions).
9B Return sensor solar		
	Return temperature sensor lead broken,	Check resistance (Pt 500) at plug-in connection F18 and terminals X6.6/X6.7; replace sensor if required. If the Vitosolic is connected, check the Vitosolic sensor (see Vitosolic service instructions).
A4 Check valve		
	Solar check valve stuck or faulty	Check the check valve and replace, if required.
A6 Secondary pump		
	No flow in secondary circuit (secondary circuit pump stopped)	Check voltage at connection 211. 2 and check secondary pump mechanically; replace if required.
A7 Solar circuit		
	No flow in solar circuit (solar circuit pump stopped)	Check voltage at connection 212.4 and check solar circuit pump; replace if required (see Vitosolic installation and service instructions).
A8 Pump heating circuit 1		
	No flow in heating circuit A1 (circuit pump stopped)	Test voltage at connection 212.2 and check pump mechanically; replace if required.

Messages (cont.)

Message System characteristics	Cause	Measures
A9 Heat pump		
	Heat pump fault ■ Heat pump faulty ■ Safety high pressure switch has responded ■ High pressure or low pressure sensor has responded 8 times within 24 h ■ Fault EEV controller ■ Temperature sensors in primary/secondary circuit faulty ■ Hot gas klixon has responded ■ Low pressure switch has responded	Scan further messages ("Message history" see page 47); check flow rates, motor currents/ motor protection, full wave soft starter and safety high pressure switch. ***Note*** *After removing fault, switch appliance OFF and ON again once.*
AB Electric heater		
	Fault, instantaneous heating water heater (appliance faulty or high limit safety cut-out has responded; alternatively no temperature rise within 24 h)	⚠ **Danger** Contact with 'live' components can lead to severe injury from electric current. Isolate the power supply prior to starting work on the appliance.

Messages (cont.)

Message System characteristics	Cause	Measures
		■ Check power supply, power cable and plug to the instantaneous heating water heater ■ Test instantaneous heating water heater control signal at connections 211.3; check high limit safety cut-out and reset if required; check instantaneous heating water heater. Installation instructions, instantaneous heating water heater
B4 A-D converter		
	Internal fault ADC (analogue digital converter, reference), ribbon cable between sensor PCB and main PCB faulty, or PCBs faulty	Check sensor connections F1, F5, F10, F15, F19 and F22 on the controller and sensor circuit board.
B5 EEPROM		
	Internal error EEPROM	Replace coding card.
B9 KM BUS solar		
	Communication error - KM BUS solar control unit, or sensor S3 of Vitosolic faulty	■ Check parameter **"Solar collector"**. ■ Check connection to Vitosolic. ■ Check sensor S3 and replace, if required (see Vitosolic installation and service instructions).

Messages (cont.)

Message System characteristics	Cause	Measures
BA KM BUS mixer HC		
	Communication fault, KM BUS or internal fault in extension set for one heating circuit with mixer	Check extension kit connections and code.
BB KM BUS mixer cooling		
	KM BUS communication error or internal fault in extension kit, NC-Box for cooling circuit	Check connections and parameter settings.
BC KM BUS R/C HC1		
	Communication error - KM BUS remote control; heating circuit without mixer A1	Check remote control connections and code; switch ON remote control.
BD KM BUS R/C HC2		
	Communication error - KM BUS remote control; heating circuit with mixer M2	Check remote control connections and code; switch ON remote control.
BF Communication module		
	LON communication error; incorrect LON communication module	Check connections and type of LON communication module. If required, replace in the following order: Cross connect PCB, ribbon cables between the cross connect PCB and the main PCB
C5 Power-OFF		
	Power-OFF enabled (triggered by power supply utility)	No measures required. If message persists: Check the connection at the controller and sensor PCB first at terminal X3.7 (feed) then at terminal X3.6 (230 V~).

Messages (cont.)

Message System characteristics	Cause	Measures
C9 Refrigerant circuit		
	Refrigerant circuit fault: ■ Safety high pressure switch has activated ■ Compressor motor protection (thermal relay) has responded (if installed: Full wave soft starter or separate compressor motor protection has responded) ■ Hot gas klixon has responded	■ Check flow and return temperature sensors in primary and secondary circuits. ■ Check primary and secondary circuits for pressure and throughput (see also message A9). ■ Have heat pump tested by a refrigeration engineer. The switching signal can be tested at connection 215.4 (230 V~) of the main PCB. ***Note*** *After removing fault, switch appliance OFF and ON again once.*
CA Primary source		
	Primary circuit fault: ■ Primary circuit pressure switch/frost protection monitoring has responded ■ Primary pump thermal motor protection	■ Check safety equipment on cross connect PCB terminals X3.9 and X3.8; in systems without safety equipment, check jumper between X3.9/X3.8. ■ Check connection at terminals 26.1/26.2 (jumper fitted in the delivered condition, plug 26 is located in the cable trunking at the control unit front). The switching signal can be tested at connection 215.3 (230 V~).

Messages (cont.)

Message System characteristics	Cause	Measures
CB Primary temperature Heat pump stops	Min. primary flow temperature (brine inlet) not achieved	■ Primary circuit flow temperature too low, no measures required
CC Coding card		
	The coding card cannot be read	■ Check coding card and replace if required. ■ Check controller and sensor PCB and replace, if required.
CD KM BUS Vitocom		
	Communication error - KM BUS Vitocom 100	Check Vitocom 100 connections and connecting cables. Check connections at the controller and sensor PCB 145 check KM BUS. A fluctuating DC voltage between approx. 20 V and 30 V can be measured at the terminals.
CE KM BUS ext. extension		
	Communication error - KM BUS external extension H1	Check external extension H1 connections and connecting cables. Check connections at the controller and sensor PCB 145 check KM BUS. A fluctuating DC voltage between approx. 20 V and 30 V can be measured at the terminals.
CF Communication module		
	Communication error - LON module in control unit	Check LON communication module and replace if required.

Messages (cont.)

Message System characteristics	Cause	Measures
D1 Compressor		
	Compressor fault: Thermal compressor relay or safety element of full wave soft starter (if installed) has responded. Separate compressor motor protection (if installed) has responded.	■ Reset compressor thermal relay, check setting, restore delivered condition (**"Standard settings"**, see menu structure). ■ Check compressor electrical connections, test coil resistance of compressor motor. Check compressor phase sequence. ■ The switching signal (from the thermal relay, full wave soft starter or a separate motor overload protection) can be tested at connection 215.3 (230 V~). ***Note*** *If overheating occurs, internal motor protection prevents a re-enabling of the compressor for 1-3 hours.* ■ If required, replace full wave soft starter (if installed); have compressor checked by a refrigeration engineer.
D3 Low pressure		
	Low pressure fault ■ Heat pump faulty ■ Primary pump faulty ■ Low pressure switch has responded or is faulty	■ Have heat pump tested by a refrigeration engineer. The signal can be tested at connection 215.5 (230 V~).

Messages (cont.)

Message System characteristics	Cause	Measures
D6 Flow switch		
	Well circuit flow switch cannot detect a flow	■ Check well pump. ■ Check primary circuit. ■ If no flow switch is installed, insert a jumper between X3.3/ X3.4. The signal can be tested at connection 216.3 or across terminals X3.3/ X3.4.
E0 LON subscriber		
	LON subscriber has failed or connection is faulty	■ Call up fault memory at faulty subscriber. ■ Check address (system and subscriber numbers); check connections and LON connecting cables.
F2 Param. output 1/2		
	Compressor output not selected	Set **"Output"** parameter accordingly.
FF New start		
	Control unit restart	No measures required.

Note
*The system is out of use if **"Simulation"** is displayed. Connection F11 must **not** be assigned.*

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Diagnosis (service scans)

Calling up diagnosis

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Diagnosis"**
3. Select required area, e.g. **"Heat pump"**

Scanning operating data

Operating data can be scanned in the following areas:

"System overview"	For further information, see page 63
"System"	For further details, see menu structure
"Heating circuit 1"	For further details, see menu structure
"Heating circuit 2"	If a heating circuit with mixer M2 is installed, see the menu structure for further details
"Cooling circuit SKK"	If a separate cooling circuit is installed, see the menu structure for further details
"DHW"	For further details, see menu structure
"Solar"	If a solar thermal system is installed, see the menu structure for further details
"Heat pump"	For further information, see page 66
"Temperature sensors"	For further details, see menu structure
"Signal inputs"	For further details, see menu structure
"Brief scan"	For further information, see page 66

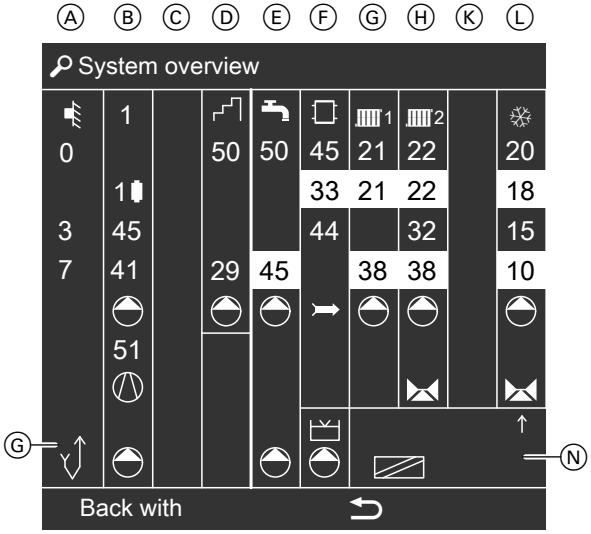
Note
*Only connected temperature sensors are displayed. In case of faults, the display shows **"- - -"**.*

System overview

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Diagnosis"**
3. **"System overview"**

Note
The display depends on the system version (e.g. column Ⓗ: Display only if heating circuit M2 is installed).
With some components the symbols move when they are operational (e.g. pumps).
The values shown are examples.

Diagnosis (service scans) (cont.)



Ⓐ to Ⓛ For an explanation of the contents of columns Ⓐ to Ⓛ, see the following tables. Columns Ⓒ and Ⓚ and not assigned.

Ⓝ Natural cooling function (▨) The arrow points at the heating/cooling circuit activated for cooling.

Ⓞ Geothermal probe symbol

Ⓐ

▪	Outside temperature sensor
0	Outside temperature
3	Primary circuit flow temperature (brine inlet temperature)
7	Primary circuit return temperature (brine outlet temperature)

Diagnosis (service scans) (cont.)

Ⓑ	
1	Refrigerant circuit (compressor stage 1)
1	Instantaneous heating water heater (at stage 1)
45	Secondary circuit flow temperature
41	Secondary circuit return temperature
	Secondary pump
51	Hot gas temperature
	Compressor
	Primary pump (primary source)

Ⓓ	
	Solar circuit
50	Collector temperature (collector temperature sensor)
29	Solar return temperature (cylinder temperature sensor) or DHW temperature sensor solar cylinder (connected to the Vitosolic)
	Solar circuit pump

Ⓔ	
	DHW
50	DHW temperature, top
45	Set DHW temperature
	Circulation pump for cylinder heating
	DHW circulation pump

Ⓕ	
	Heating water buffer cylinder
45	Heating water buffer cylinder temperature
33	Set temperature, heating water buffer cylinder
44	System flow temperature
	System flow
	Swimming pool
	Swimming pool circuit pump

Ⓖ	
1	Heating circuit A1 (without mixer)
21	Room temperature
21	Set room temperature
38	Set heating circuit flow temperature
	Heating circuit pump

Ⓗ	
2	Heating circuit with mixer M2
22	Room temperature
22	Set room temperature
33	Heating circuit flow temperature
38	Set heating circuit flow temperature
	Heating circuit pump
	Mixer

Ⓛ	
	Separate cooling circuit
20	Room temperature
18	Set room temperature
15	Flow temperature, separate cooling circuit
10	Flow temperature, separate cooling circuit, set value
	"Cooling circuit pump": NC signal
	Mixer

Diagnosis (service scans) (cont.)

Heat pump module diagnosis

As part of the heat pump module diagnosis, the compressor hours run can be scanned for different load classes.
A load class specifies the compressor operation at a certain differential of evaporation and condensation temperature $\Delta T_{V/K}$.

Compressor runtime (hours run according to load classes)

The compressor hours run (**"Hours run"**) can be scanned with ◆▶ for every **"Load class"**.

Assigning the load classes:

Load class	Hours run for $\Delta T_{V/K}$
1	$\Delta T_{V/K} < 25$ K
2	25 K < $\Delta T_{V/K}$ < 32 K
3	32 K < $\Delta T_{V/K}$ < 41 K
4	41 K < $\Delta T_{V/K}$ < 50 K
5	$\Delta T_{V/K} > 50$ K

$\Delta T_{V/K}$ Differential, evaporation and condensation temperature

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Diagnosis"**
3. **"Heat pump"**
4. **"Runtime compressor"**

Brief scan

In the brief scan, you can scan temperatures, software versions and connected components, for example.

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Diagnosis"**
3. **"Brief scan"**

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Diagnosis (service scans) (cont.)

For an explanation of the relevant values in the individual lines, see the following table:

Line (brief scan)	Field					
	1	2	3	4	5	6
1	Control unit: Software version (SW index)		Device: Version Coding card: ID Low		Coding card: Version	
2	System scheme		Number of KM BUS users	Common demand temperature		
3	0	Programming unit: Software index	Extension for heating circuit with mixer: Software version	Solar control unit: Software version	LON module: Software version	External extension: Software version
4	0	0	0	0	Appliance type	
5	0: no external demand 1: external demand	0: no external blocking 1: external blocking	0	External 0 to 10 V hook-up Display in % 0: no external hook-up		
6	Number of LON subscribers		Check digit	0	0	0
7	Remote control: **Heating circuit without mixer A1:** 0 w/o 1 Vitotrol 200	Software version	**Heating circuit with mixer M2** 0 w/o 1 Vitotrol 200	Software version	0	0
8	EEV module 1: Hardware index		EEV module 1: Software index		Extension for heating circuit with mixer for separate cooling circuit: Software version	

Diagnosis (service scans) (cont.)

Line (brief scan)	Field					
	1	2	3	4	5	6
9	0	0	0	0	0	0
10	Control unit: Software version High		Control unit: Software version Low		Programming unit: Software version	

Testing outputs (actuator test)

- Only actuators are shown that correspond to the actual system equipment level.
- Activating the actuator test switches all actuators to zero volt.
- One or several actuators can be started from this menu.
- The actuator test stops automatically after approx. 30 min or with ⮌.
- With ◖◗ **"System overview"** and the diagnosis page **"EEV module"** can be called up, **without** exiting the actuator test. Back to the actuator test display with **OK**.

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Actuator test"**

Note
- *If a cylinder primary pump is controlled via the PWM signal, activate **both** outputs **"Cylinder prim pump"**.*
- *All actuators can be switched off simultaneously with **"All actuators"**.*

Function check

To test the function of connected components (see commissioning assistant, page 43).

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Service functions"**
3. **"Function check"**
4. Select required group, e.g. **"DHW"**.

Function check (cont.)

"Function check" menu

Function	System characteristics
Heating circuit 1	Secondary pump and heating circuit pump A1 are started.
Heating circuit 2	Heating circuit pump M2 starts. Open/close mixer every 5 min.
Separate cooling circuit	Primary pump and circulation pump, separate cooling circuit are started. Open/close mixer every 5 min.
DHW (DHW cylinder)	Secondary pump, circulation pump for cylinder heating (heating water side) and cylinder primary pump (DHW side) are started.
Swimming pool	Secondary pump is started. Swimming pool output is switched on/off every minute.
Electric heater (instantaneous heating water heater, accessory)	Secondary pump is started. Instantaneous heating water heater regulates to a flow temperature of 30 °C.
Heat pump	Primary pump and secondary pump are started. Heat pump regulates to a return temperature of 30 °C.
Solar	Solar circuit pump starts. ***Note*** *If the Vitosolic is connected, only the display for the solar circuit pump is activated in the system overview. Start the solar circuit pump via the Vitosolic (see Vitosolic service instructions).*
Primary source ***Note*** *The execution of this function lasts 10 min.*	The primary pump starts. The primary circuit flow temperature is averaged every minute. ***Note*** *This function determines the temperature of the undisturbed ground.* *If the function is terminated earlier, the average value calculated at the time of the termination is saved.*

Steps if the room temperature is too low

1. Vent the heating circuits.

Steps if the room temperature is too low (cont.)

2. Check throughput of affected heating circuits. Recommended temperature differential between heating flow and return approx. 8 K.
3. Hydraulically balance the connected heating circuits.
4. Check the outside temperature sensor (see page 73).
5. Increase the set room temperature for standard mode and match the heating curves.

   Operating instructions

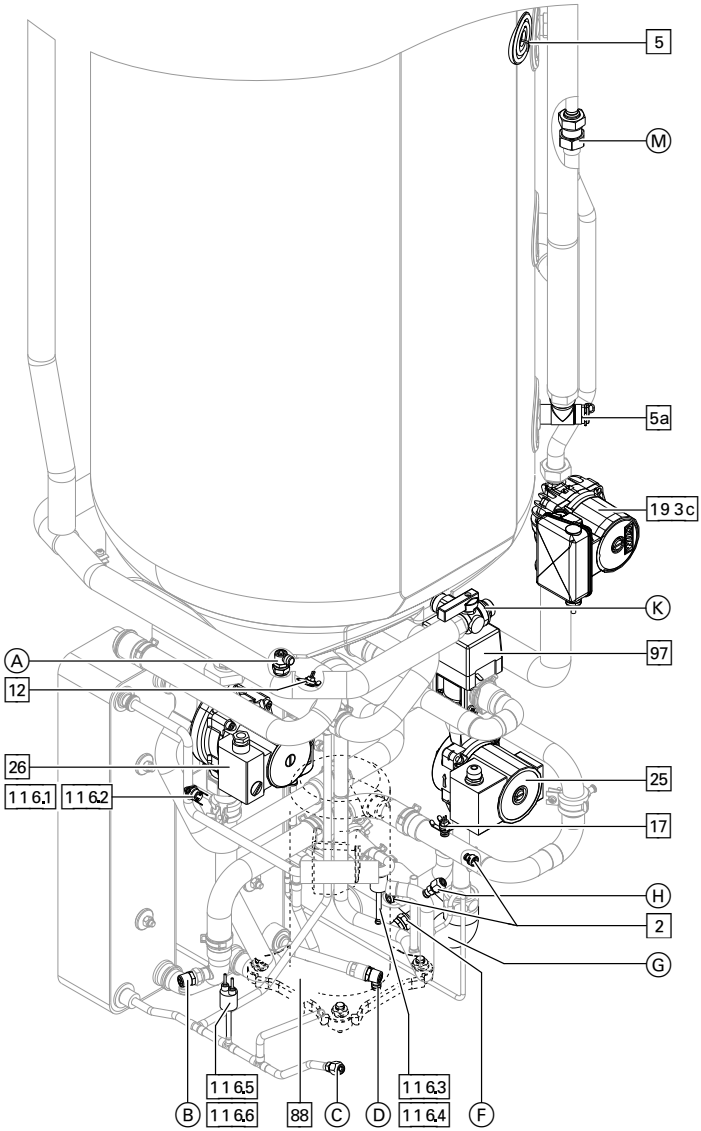
6. Enable heating operation via the integral instantaneous heating water heater (if installed) (see page 96).

No display indication on the programming unit

1. Switch ON system ON/OFF switch.
2. Check heat pump control unit fuse; replace if required (see page 74).
3. Check whether there is power at the control unit; switch ON power supply if required.
4. Check the plug-in and threaded connections.
5. Replace programming unit if required.
6. Replace PCB 2 (main PCB) if required.

Repairs

Overview of internal components

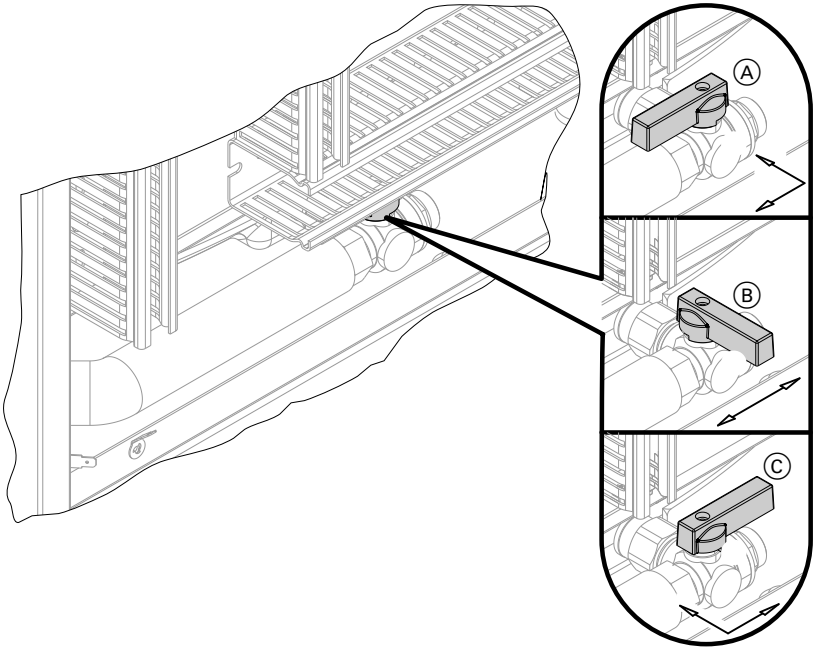


Repairs (cont.)

- [2] Secondary circuit flow temperature sensor (alternative positions)
- [5] Cylinder temperature sensor
- [5]a Solar circuit return temperature sensor
- [12] Primary circuit flow temperature (heat pump brine inlet)
- [17] Secondary circuit, return temperature sensor
- [25] Secondary pump
- [26] Primary pump
- [88] Compressor
- [97] Three-way diverter valve heating/DHW
- [116] Connection at terminals:
  - 1, 2 Hot gas temperature sensor
  - 3, 4 Low pressure sensor
  - 5, 6 Safety high pressure sensor
- [193]c Cylinder primary pump
- Ⓐ Primary circuit air vent valve
- Ⓑ Condenser drain valve
- Ⓒ Schrader high pressure valve
- Ⓓ Primary pump drain valve
- Ⓕ Drain valve on the secondary side
- Ⓖ Pipe / position instantaneous heating water heater
- Ⓗ Schrader low pressure valve
- Ⓚ Drain & fill valve, DHW cylinder
- Ⓜ Non-return valve

Repairs (cont.)

Positions cylinder drain & fill valve



Ⓐ Drain & fill valve, cylinder, closed
Ⓑ Drain & fill valve, cylinder, open to drain the internal DHW line
Ⓒ Drain & fill valve, cylinder, open to drain or fill the cylinder

Draining the heat pump on the secondary side

1. Close on-site drain & fill valve.

2. Drain heat pump at secondary flow drain valve (see page 71).

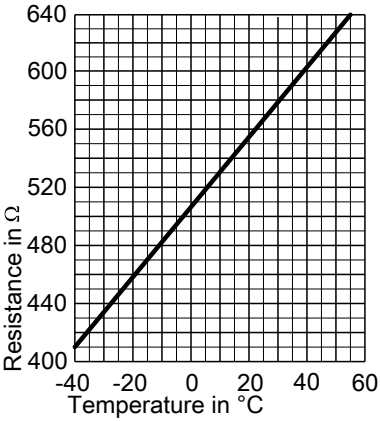
Checking sensors

For sensor connections to the controller and sensor PCB, see page 127.

For the position of the sensors in the heat pump, see figure on page 71.

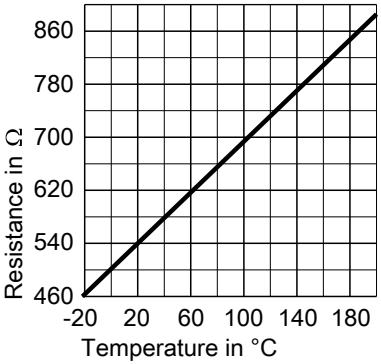
Repairs (cont.)

Temperature sensors type Ni 500



Capturing element: "Ni 500"
- Outside temperature sensor (F0)
- Flow temperature sensors, heating circuits M2 (F12)
- Flow temperature sensor, separate cooling circuit
- Room temperature sensors (Vitotrol)

Temperature sensors type Pt 500



Capturing element "Pt 500"
- Flow temperature sensor, system (F13)
- Buffer temperature sensor (F4)
- Cylinder temperature sensor (F6)
- Flow/return temperature sensor, secondary circuit (F8/F9)
- All sensors inside the heat pump
- Collector temperature sensor (F21)

Checking the fuse

For fuse locations, see from page 119:
- Fuse F1 is located on the luster terminals.
- Fuse F3 is located on the main PCB.

Fuse F1 and F3:
- 6.3 A (slow), 250 V~
- Max. power loss $\leq$ 2.5 W

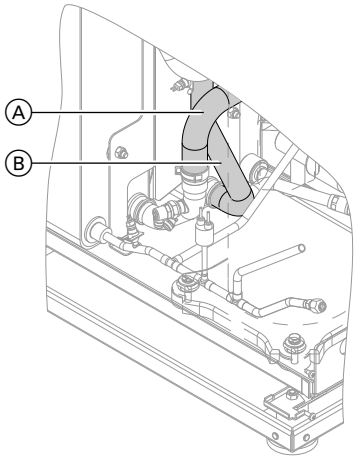
Repairs (cont.)

Danger
Contact with 'live' components can lead to severe injury from electric current.
Before working on the equipment, always ensure that **the power circuit is also at zero volt.**

Removing the fuse does **not switch the power circuit to zero volt**.

Appliance too noisy

Possible causes:
- Transport locking bracket not removed: See page 22.
- Control unit door not tightly sealed: See page 20.
- Secondary circuit return line Ⓐ touches the primary circuit return line Ⓑ or other lines or the compressor.



Control unit settings by the contractor

The following pages **only** describe those parameters that can **only** be adjusted by specialists operating in the service menu at **"Coding level 1"**.
Customer level parameters that are described in the operating instructions are **not** explained here.

Note
The available parameters depend on the individual system configuration (e.g. parameters for heating circuit M2: display only if heating circuit M2 is configured).

Please note
Incorrect operation at "**Coding level 1**" can result in damage to the appliance and heating system.
Always observe the installation instructions; failure to observe these will void your warranty rights.

Activating service menu

The service menu can be activated from any menu.

Press **OK** + ☰: simultaneously for approx. 4 s.

Disabling the service menu

The service menu remains active until it is deactivated with **"Terminate service?"**, or if no operation takes place for 30 minutes.

Setting parameters, using the example "System scheme"

To set a parameter, first select the parameter group and then the parameters.
All parameters are displayed as plain text. A parameter code is also assigned to each parameter.

Service menu:
1. Press **OK** + ☰: simultaneously for approx. 4 s.
2. Select **"Coding level 1"**.
3. Select parameter group: **"System definition"**
4. Select parameter: **"System scheme 7000"**
5. Adjust system scheme: **"2"**

Control unit settings by the contractor (cont.)

Alternatively, if the service menu was already activated:

Extended menu
1. ☰:
2. **"Service"**
3. Select **"Coding level 1"**.
4. Select parameter group: **"System definition"**
5. Select parameter: **"System scheme"**
6. Confirm parameter code: **"7000"**
7. Select language: **"2"**

Note
The parameters shown depend on the current device settings.

Reinstating the delivered condition (Reset)

Service menu:
1. Press **OK** + ☰: simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Standard setting"**
4. **"All groups"**
   or
   Select required parameter group (e.g. **"System definition"**).

Parameter group system definition

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"System definition"**
4. Select parameter.

7000 System scheme

"System scheme 7000"

Adjust the system scheme during commissioning according to the system version. 12 different system schemes are available (see technical guide).

The components associated with the corresponding system scheme are automatically enabled and monitored.

Setting	Heating circuit without mixer A1	Heating circuit with mixer M2	DHW heating
0	—	—	X
1	X	—	—
2	X	—	X
3	—	X	—
4	—	X	X
5	X	X	—
6	X	X	X
7-10	Do not adjust.		
11	External control		

Delivered condition 2
Setting 0 to 11

7001 Language

Note
Adjust only in the extended menu.

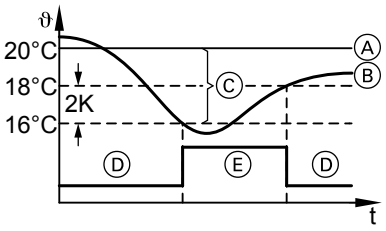
Operating instructions

Language for operating and display elements in the control unit.

7003 Temperature differential for the heating limit

"Temperature differential heating 7003"

Temperature differential for calculating the heating limit.
Heating limit: Set room temperature minus **"Temperature differential heating"**
If the average outside temperature calculated over 3 hours falls below the heating limit, central heating starts.



Example:
The selected set room temperature is 20 °C; the value set under **"Temperature differential heating"** is 4 K.
This results in a heating limit of 16 °C (20 °C – 4 K).
Central heating commences if the average outside temperature drops below 16 °C (heating limit).
If the average outside temperature exceeds 18 °C, central heating stops (because of the specified hysteresis of 2 K).

Ⓐ Set room temperature
Ⓑ Adjusted outside temperature
Ⓒ Selected value **"Temperature differential heating"**
Ⓓ Heating mode OFF
Ⓔ Heating mode ON

Delivered condition	40 (≙ 4 K)
Setting range	0 to 200 (≙ 0 to 20 K)

7004 Temperature differential for the cooling limit

"Temperature differential cooling 7004"

Temperature differential for calculating the cooling limit.
Cooling limit: Set room temperature plus **"Temperature differential cooling"**
If the average outside temperature calculated over 3 hours exceeds the cooling limit, room cooling is switched on.

Example:
The selected set room temperature is 20 °C; the value set under **"Temperature differential cooling"** is 4 K.
This results in a cooling limit of 24 °C (20 °C + 4 K).
Room cooling commences if the average outside temperature rises above 24 °C (cooling limit).

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7004 Temperature differential for the cooling… (cont.)

Room cooling stops if the average outside temperature falls below 23 °C (because of the specified hysteresis of 1 K).

Note
*This parameter is only available if cooling mode has been enabled via parameter **"Cooling"** (see page 110).*

Delivered condition	40 (≙ 4 K)
Setting range	10 to 200 (≙ 1 to 20 K)

7010 External extension

"External extension 7010"

Enabling external extension H1.

External extension H1 can be used for the following hook-ups/components:
- Swimming pool water heating
- External operating mode changeover
- External demand
- External mixer OPEN
- External blocking
- External mixer CLOSE

Note
***Only one** external extension can be connected to the control unit.*
*If the components for swimming pool heating are connected to "External extension H1", **no** additional hook-up (e.g. operating mode changeover) can be connected to the "External extension H1".*

Value	Explanation
"1"	External extension H1 is installed and enabled.
"0"	External extension H1 is not enabled.

Delivered condition	0
Setting	1 / 0

7008 Swimming pool

"Swimming pool 7008"

7008 Swimming pool (cont.)

Swimming pool heating

Value	Explanation
"1"	Swimming pool is connected and will be heated.
"0"	Swimming pool will not be heated.

Note
*The thermostat for swimming pool temperature control is connected to the control unit via external extension H1. Set parameter **"External extension"** to **"1"** (see page 80), otherwise the **"Swimming pool"** parameter will not be displayed.*

Delivered condition 0
Setting 1 / 0

7011 External operating mode changeover

"Changing the heating circuit operating mode 7011"

Note
Only in conjunction with external extension H1.

Setting which system components the operating mode is changed over for when signal "Operating mode" is issued (signal active when the contact is closed, see summary of PCB from page 119). With the external operating mode changeover a heating circuit, for example, can be switched via a Vitocom from the operating mode "Reduced" to "Normal".

Note
- *The signal "External blocking" has a higher priority than the signal "External demand".*
- *The function via parameter **"External demand mixer "OPEN" 7014"** has a higher priority than the function via parameter **"Changing the heating circuit operating mode 7011"**.*
- *In the parameters **"Effect of operating mode changeover 7012"** and **"Duration of operating mode changeover 7013"** also set the required operating mode and the changeover duration.*

Setting	Heating circuit without mixer A1	Heating circuit with mixer M2	DHW heating	Heating water buffer cylinder
0	—	—	—	—
1	X	—	—	—
2	—	X	—	—
3	X	X	—	—
4-15	Do not adjust.			
16	—	—	X	—

7011 External operating mode changeover (cont.)

Setting	Heating circuit without mixer A1	Heating circuit with mixer M2	DHW heating	Heating water buffer cylinder
17	X	—	X	—
18	—	X	X	—
19	X	X	X	—
20-31	Do not adjust.			
32	—	—	—	X
33	X	—	—	X
34	—	X	—	X
35	X	X	—	X
36-47	Do not adjust.			
48	—	—	X	X
49	X	—	X	X
50	—	X	X	X
51	X	X	X	X
52-63	Do not adjust.			

Delivered condition 0
Setting range 0 to 63

7012 Operating mode for external operating mode changeover

"Effect of operating mode changeover 7012"

Note
Only in conjunction with external extension H1.

Operating modes
Operating instructions

Setting the operating mode that is enabled with the external operating mode changeover (see also **"Changing the heating circuit operating mode 7011"**).

Value	Operating mode (see operating instructions)	
	Heating	DHW
"0"	**"Standby"**	**"OFF"**
"1"	**"Reduced"**	**"Top"**

7012 Operating mode for external operating mode… (cont.)

Value	Operating mode (see operating instructions)	
	Heating	**DHW**
"2"	**"Normal"**	**"Normal"**
"3"	**"Fixed value"** (see set flow temperature on page 102)	**"Temperature 2"**

Delivered condition 2
Setting range 0 to 3

7013 Duration of external operating mode changeover

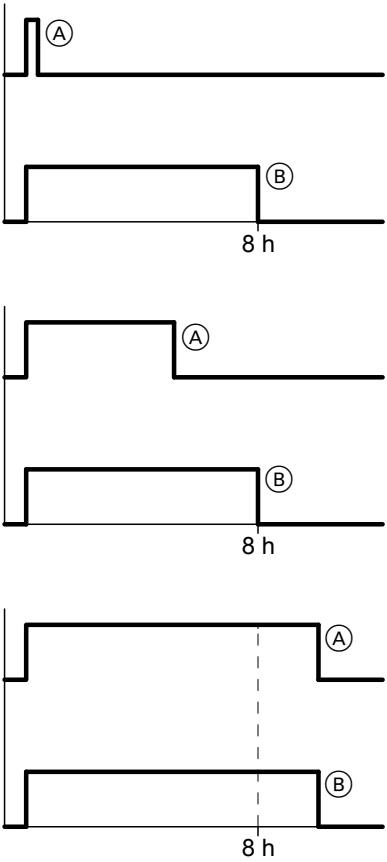
"Duration of operating mode changeover 7013"

Note
Only in conjunction with external extension H1.

Setting the **minimum** duration of external operating mode changeover (see also **"Changing the heating circuit operating mode 7011"**). After expiry, the control unit switches back to the operating mode that was enabled before the external operating mode changeover. This also occurs if party mode was enabled in the meantime.

7013 Duration of external operating mode… (cont.)

Example:



The diagram shows the duration of external operating mode changeover Ⓑ, subject to signal duration Ⓐ, with parameter **"Duration of operating mode changeover 7013"** set to 8 h (delivered condition).
The external operating mode changeover is enabled for at least 8 h (delivered condition), independent of the length of the signal. If the signal lasts for longer than 8 h, the external operating mode changeover remains enabled for as long as the signal is present.

Value	Duration
"0"	Changeover is only carried out as long as signal "External demand / mixer OPEN" is available.
"1" to **"12"**	Duration of the operating mode changeover in hours, starting with the activation of the external operating mode changeover.

Delivered condition 8 h
Setting range 0 to 12 h

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7014 External demand mixer "OPEN"

"External demand mixer "OPEN" 7014"

Note
Only in conjunction with external extension H1.

Setting for the way the signal "External demand" is to affect the heat pump (signal active when the contact is closed; see summary of PCBs from page 119).

Note
- *The signal "External blocking" has a higher priority than the signal "External demand".*
- *See also "Set flow temperature, external demand" on page 102.*

Setting	Heating circuit with mixer M2	Heat demand to the heat pump
0	Control mode	No
1	Mixer "Open"	No
2-3	Do not adjust.	
4	Control mode	Yes
5	Mixer "Open"	Yes
6-7	Do not adjust.	

Delivered condition 4
Setting range 0 to 7

7015 External blocking mixer "CLOSED"

"External blocking mixer "CLOSED" 7015"

Note
Only in conjunction with external extension H1.

Setting for how the signal "External blocking" is to affect the heat pump (signal active when contact is closed; see summary of PCBs from page 119).

Note
- *The signal "External blocking" has a higher priority than the signal "External demand".*
- *See also parameter "Set flow temperature for external demand" on page 102.*

Please note
The system may no longer be protected against frost.

7015 External blocking mixer "CLOSED" (cont.)

Setting	Heating circuit with mixer M2	Heat pump blocking
0	Control mode	No
1	Mixer "Close"	No
2-3	Do not adjust.	
4	Control mode	Yes
5	Mixer "Close"	Yes
6-7	Do not adjust.	

Delivered condition 4
Setting range 0 to 8

7017 Vitocom 100

"Vitocom 100 7017"

Using the Vitocom 100 communication interface.

Delivered condition 0
Setting 1 / 0

Value	Explanation
"1"	Vitocom 100 is installed and enabled.
"0"	Vitocom 100 is not used.

701B Common system temperature sensor

"Common system sensor 701B"

In systems with a heating water buffer cylinder, a common flow temperature sensor ("System flow temperature sensor") can be installed in the heating water flow, downstream of the heating water buffer cylinder.

Value	Explanation
"1"	System flow temperature sensor is installed and enabled.
"0"	System flow temperature sensor is not used. The flow temperature sensor for the secondary circuit is not used.

701B Common system temperature sensor (cont.)

Delivered condition	1
Setting	1 / 0

Parameter group compressor

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Compressor"**
4. Select parameter.

5000 Enable compressor

"Enable 5000"

Enabling the compressor stage.

Note
***Never** block the heat pump compressor in standard mode.*

Value	Explanation
"1"	Compressor stage is used.
"0"	Compressor stage is not used, e.g. in case of a fault.

Delivered condition 1
Setting 1 / 0

5030 Heat pump output

"Output compressor stage 5030"

Type-dependent heating output of heat pump.

This value is required to calculate the energy statement and seasonal performance factor.

Delivered condition: Specified via coding card according to rated heating output of heat pump (e.g. 8 kW for type 108; see type plate for rated heating output)
Setting range: 1 to 255 kW

Parameter group DHW

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"DHW"**
4. Select parameter.

6000 Set cylinder temperature

"Cylinder temperature DHW 6000"

DHW cylinder set temperature for DHW heating.

Operating instructions

Note
*If the heat pump alone cannot achieve the set DHW temperature, the instantaneous heating water heater (accessory) is also started (if enabled via parameter **"DHW with e heating 6015"**).*

Delivered condition	500 (≙ 50 °C)
Setting range	100 to 700 (≙ 10 to 70 °C)

6015 DHW reheating

"DHW with e heating 6015"

DHW reheating enabled via instantaneous heating water heater (accessory). If the set cylinder temperature cannot be achieved with the heat pump, an instantaneous heating water heater (accessory) can be used.

Note
- *The instantaneous heating water heater (accessory) has to be enabled separately with parameter **"Inst. heating water heater 7900"**.*
- *Observe setting for **"Booster heater hysteresis 6008"**.*

6015 DHW reheating (cont.)

Value	Explanation
"1"	Instantaneous heating water heater (accessory) is connected and enabled for DHW reheating.
"0"	Instantaneous heating water heater (accessory) is not enabled for DHW reheating.

Delivered condition 1
Setting 1 / 0

6005 Minimum temperature for DHW cylinder

"Minimum temperature 6005"

Lower set temperature for DHW cylinder (minimum temperature).
When the actual temperature falls below the minimum temperature selected, the DHW cylinder is heated up to that value plus hysteresis (frost protection). This is independent of the selected operating programme.

The temperature for this is always captured by the top cylinder temperature sensor.

Delivered condition 100 (≙ 10 °C)
Setting range 50 to 600 (≙ 5 to 60 °C)

6006 Maximum temperature for DHW cylinder

"Maximum temperature 6006"

Upper temperature limit for DHW cylinders.
When this temperature has been reached, the DHW cylinder is not reheated until the temperature has dropped by at least 5 K.

Danger
Risk of scalding with DHW at **temperatures above 60 °C**.
To limit the temperature to 60 °C, install a mixing device, e.g. an automatic thermostatic mixing valve (DHW cylinder accessory).

Delivered condition 600 (≙ 60 °C)
Setting range 200 to 800 (≙ 20 to 80 °C)

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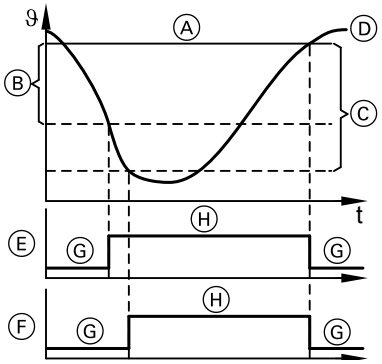
6007/6008 DHW / Booster heater hysteresis

"DHW hysteresis 6007"
"Booster heater hysteresis 6008"

Cylinder temperature hysteresis for starting and stopping DHW heating. The set value determines the deviation from the set DHW cylinder temperature (**"Cylinder temperature DHW 6000"**) at which DHW heating is started and stopped. Parameter **"DHW hysteresis 6007"** relates to DHW heating with the heat pump. Parameter **"Booster heater hysteresis 6008"** specifies the hysteresis for heating with the instantaneous heating water heater (accessory).



Ⓐ Set DHW temperature
Ⓑ Heat pump hysteresis (**"DHW hysteresis 6007"**)
Ⓒ Booster heater hysteresis (**"Booster heater hysteresis 6008"**)
Ⓓ Actual DHW temperature at the top cylinder temperature sensor
Ⓔ Heat pump switching state
Ⓕ Booster heater switching state
Ⓖ OFF
Ⓗ ON

Note

- *The value selected for **"DHW hysteresis 6007"** should be higher than the expected temperature drop due to heat losses while the heating circuits are in reduced mode (approx. 5 K).*
- *A lower value for **"Booster heater hysteresis 6008"** increases the proportion of DHW heating with the booster heater.*
- *Observe setting for **"DHW with e heating 6015"**.*

	DHW hysteresis 6007	**Booster heater hysteresis 6008**
Delivered condition	70 (≙ 7 K)	100 (≙ 10 K)
Setting range	10 to 100 (≙ 1 to 10 K)	20 to 700 (≙ 2 to 70 K)

6009 DHW start optimisation

"Start optimisation 6009"

Comfort function for DHW cylinder heating.

Delivered condition 0
Setting range 1 / 0

Operating instructions

600A DHW stop optimisation

"Stop optimisation 600A"

Comfort function for DHW cylinder heating.

Delivered condition 0
Setting range 1 / 0

Operating instructions

600C Set DHW temperature 2

"Set temperature 2 600C"

Set temperature for auxiliary DHW heat-up function to kill bacteria.

Operating instructions

Delivered condition 600 (≙ 60 °C)
Setting range 100 to 700 (≙ 10 to 70 °C)

600E Temperature sensor 2

"Temperature sensor 2 600E"

No function.

6016 DHW heating priority

"Combi cylinder 6016"

No function.

6017 DHW at control high pressure

"No. of attempts DHW 6017"

High set cylinder temperatures can result in shutdowns through controlled high pressure. Upon demand, the control unit tries to restart DHW heating. This parameter determines the number of start attempts.

Note
DHW heating that is blocked is automatically enabled again when the operating status changes over for heating the DHW cylinder from a lower to a higher temperature level, for example from ***"Top"*** *to* ***"Normal"*** *(see the operating instructions for further details regarding the operating status).*

Delivered condition	1
Setting range	0 to 10

6020 Cylinder primary pump operating mode

"Cylinder primary pump type 6020"

To select the operating mode of the cylinder primary pump.

Value	Explanation
"0"	Cylinder primary pump not controlled via PWM signal.
"1"	Standard operation of the cylinder primary pump: ON/OFF, control via PWM signal
"2"	Operation at a fixed speed, control via PWM signal
"3"	Variable speed operation of the cylinder primary pump via PWM signal.

Delivered condition	3
Setting range	0 to 3

Parameter group solar

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Solar"**
4. Select parameter.

7A00 Solar control unit

"Solar control unit type 7A00"

For adjusting the solar control unit used.

Value	Explanation
"0"	There is no solar control unit.
"1"	Vitosolic 100
"2"	Vitosolic 200
"3"	No function
"4"	Internal solar control unit

Delivered condition 0
Setting range 0 to 4

7A01 Maximum collector temperature

"Maximum temperature 7A01"

For adjusting the max. collector temperature.

The solar circuit pump will be switched OFF, if the max. collector temperature is exceeded.

Delivered condition 1300 (≙ 130 °C)
Setting range 1000 to 3000 (≙ 100 to 300 °C)

7A02/7A03 Solar circuit pump hysteresis

"Hysteresis solar circuit pump ON 7A02"
"Hysteresis solar circuit pump OFF 7A03"

7A02/7A03 Solar circuit pump hysteresis (cont.)

The set value determines the temperature differential between the collector temperature and the temperature of the DHW cylinder at which the solar circuit pump starts and stops.

Note
*The value for **"Hysteresis solar pump ON 7A02"** must be greater than the value for **"Hysteresis solar pump OFF 7A03"**.*

	Hysteresis solar circuit pump ON 7A02	**Hysteresis solar circuit pump OFF 7A03**
Delivered condition	70 (≙ 7 K)	30 (≙ 3 K)
Setting range	20 to 200 (≙ 2 to 20 K)	10 to 150 (≙ 1 to 15 K)

7A07 Solar circuit flow rate

"Flow rate 7A07"

For adjusting the flow rate in the solar circuit.
This value is used to calculate the solar yield. The value for the flow rate must be calculated from the set pump rate of the solar circuit pump and the pressure drop in the solar circuit.

Delivered condition	100 l/h
Setting	10 to 500 l/h

7A09 Fault message faulty circulation

"Detect faulty circulation 7A09"

To select whether the fault message for a faulty check valve in the solar circuit should be displayed (inverse circulation).

Delivered condition	1
Setting	0 / 1

Value	**Explanation**
"1"	Fault messages appears.
"0"	Fault messages does not appear.

Parameter group electric heater

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Electric heater"**
4. Select parameter.

7900 Instantaneous heating water heater (accessory)

"Inst. heating water heater 7900"

If an instantaneous heating water heater (accessory) is installed in the heating water flow, it must be enabled. It can be enabled either for DHW reheating only and/or for heating mode.

Parameter	**Enabling the instantaneous heating water heater for**	
	heating mode	**DHW reheating**
"Inst. heating water heater 7900"	**"1"**	**"1"**
"Heating with electro 7902"	**"1"**	**"0"**
"DHW with e heating 6015"	**"0"**	**"1"**

Please note
Setting "**0**" in parameter **"Inst. heating water heater 7900"** switches the instantaneous heating water heater completely OFF, so that it is also unavailable for heating to provide frost protection.
For the instantaneous heating water heater to be able to start in case of a heat demand for frost protection, set parameter "**Heating with electro** 7902" to **"0"** to shut down, but set **"Inst. heating water heater 7900"** to **"1"**.

Delivered condition	0
Setting	0 / 1

7902 Heating mode with booster heater

"Heating with electro 7902"

Enabling heating mode with the instantaneous heating water heater (accessory).
If the set flow temperature cannot be achieved with the heat pump, an instantaneous heating water heater (accessory) can be used.

Note
The instantaneous heating water heater (accessory) has to be enabled separately with parameter ***"Inst. heating water heater 7900"****.*

Value	Explanation
"1"	Instantaneous heating water heater (accessory) is connected and enabled for heating mode.
"0"	Instantaneous heating water heater (accessory) is disabled for heating mode.

Delivered condition	1
Setting	1 / 0

7907 Max. stage instantaneous heating water heater

"Maximum stage, electric heating 7907"

This setting determines the maximum output (stage 1, 2 or 3) of the instantaneous heating water heaters, with which DHW or system heating is carried out.

Delivered condition	1
Setting range	1

Note
With the Vitocal 242-G, only stage 1 is available for operation with maximum output.

790A Stage at power-OFF

"Stage at power-OFF 790A"

Maximum output stage of the instantaneous heating water heater (accessory) during the power-OFF.
The selected stage and all those below it will be enabled.

Note
With the Vitocal 242-G, only stage 1 is available for operation with maximum output.

790A Stage at power-OFF (cont.)

Value	Explanation
"0"	Instantaneous heating water heater remains off during power-OFF, except for frost protection.
"1"	Max. output stage, e.g. 9 kW

Delivered condition 0
Setting range 0 / 1

790B Dual mode temperature instantaneous heating water heater

"Dual mode temperature, electric heater 790B"

Temperature limit for heating with the instantaneous heating water heater (accessory).
If the long-term average outside temperature falls below the dual mode temperature, the control unit enables heating mode with the instantaneous heating water heater.

Above the dual mode temperature, the control unit starts the instantaneous heating water heater only if the heat pump develops a fault.

Delivered condition 100 (≙ 10 °C)
Setting range –500 to +500 (≙ –50 to +50 °C)

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Parameter group internal hydraulics

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Internal hydraulics"**
4. Select parameter.

7300 Heat pump for drying a building

"Heat pump for drying a building 7300"

For drying buildings, the heat pump can be used **in addition** to the instantaneous heating water heater (accessory).
If the heat pump is not ready for use (e.g. primary circuit is not yet completed), this function must be set to **"0"** (delivered condition).

Note
- *When using the heat pump to dry a building, observe the loading of the geothermal probe.*
- *Drying buildings with an instantaneous heating water heater (accessory) results in high power consumption.*

Value	Explanation
"1"	Heat pump is used for drying a building.
"0"	Heat pump is not used for drying a building.

Delivered condition 0
Setting 1 / 0

7303 Screed program

"Screed program 7303"

Temperature/time profile for screed drying.

Please note
Risk of damage to building through overheating screed with high flow temperatures.
Install a temperature limiter into the flow of the underfloor heating circuit to limit the maximum temperature.

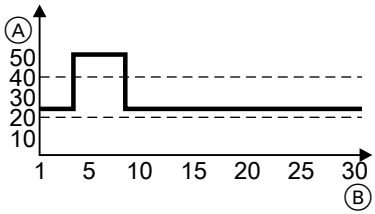
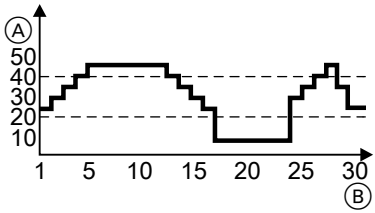
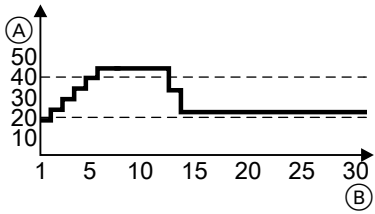
7303 Screed program (cont.)

- The screed programme affects all enabled heating circuits in parallel.
- The selected **"Screed program"** is continued after a power failure or after the control unit has been switched off.
- The selected operating programme continues if the **"Screed program"** has terminated in accordance with the programme or, before its expiry, the temperature/time profile "**0**" is selected.
- The temperature/time profiles 7 to 12 regulate to the maximum flow temperature.
- If the time profile has a higher set flow temperature, the set temperature is limited by parameter **"Maximum flow temperature"** (see page 109) for the heating circuit.
- The power consumption increases when using an instantaneous heating water heater (accessory) for drying buildings.

Note

Observe the specifications of EN 1264-4. The report to be provided by the heating contractor must contain the following heat-up details:

- *Heat-up data with respective flow temperatures*
- *Max. flow temperature achieved*
- *Operating condition and outside temperature during handover*

Value	**Temperature:time profile** Ⓐ **Flow temperature** Ⓑ **Days**
"0"	**No temperature/time profile** Termination of the current profile and operation continued in heating or cooling mode.
"1"	**Temperature/time profile 1 (in acc. with EN 1264-4)** 
"2"	**Temperature/time profile 2 (to ZV parquet and flooring technology)** 
"3"	**Temperature/time profile 3 (to ÖNORM)** 

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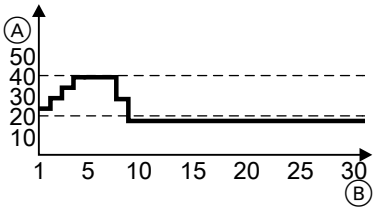
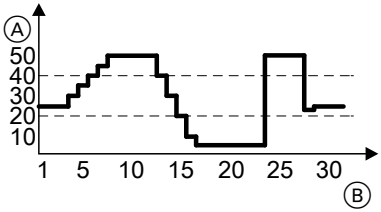
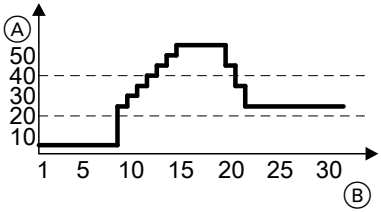
7303 Screed program (cont.)

Value	Temperature:time profile Ⓐ Flow temperature Ⓑ Days
"4"	**Temperature/time profile 4** 
"5"	**Temperature/time profile 5** 
"6"	**Temperature/time profile 6** 

Value	Temperature:time profile Ⓐ Flow temperature Ⓑ Days
"7"	**Fixed value temperature programme** Duration: 5 days
"8"	**Fixed value temperature programme** Duration: 10 days
"9"	**Fixed value temperature programme** Duration: 15 days
"10"	**Fixed value temperature programme** Duration: 20 days
"11"	**Fixed value temperature programme** Duration: 25 days
"12"	**Fixed value temperature programme** Duration: 30 days

Delivered condition	0
Setting range	0 to 12

730D Operation with three-way diverter valve

"Heating/DHW diverter valve 730D"

Never adjust (delivered condition "1").

730C Set flow temperature, external demand

"Set flow temperature, external demand 730C"

Set flow temperature in case of external demand, e.g. from the swimming pool (see page 85).

In contrast to room temperature-dependent or weather-compensated set flow temperatures, a fixed set flow temperature is selected here, for example for heating circuits.

Delivered condition	500 (≙ 50 °C)
Setting range	0 to 700 (≙ 0 to 70 °C)

7320 Primary pump operating mode

"Primary source type 7320"

To select the operating mode of the primary pump.

Value	Explanation
"0"	Primary pump not controlled via PWM signal.
"1"	Standard operation of the primary pump: ON/OFF, control via PWM signal
"2"	Operation at a fixed speed, control via PWM signal
"3"	Variable speed operation of the primary pump via PWM signal.

Delivered condition	0
Setting range	0 to 3

7340 Secondary pump operating mode

"Secondary pump type 7340"

To select the operating mode of the secondary pump.

Value	Explanation
"0"	Secondary pump is not controlled via PWM signal.
"1"	Standard operation of the secondary pump: ON/OFF, control via PWM signal

7340 Secondary pump operating mode (cont.)

Value	Explanation
"2"	Operation at a fixed speed, control via PWM signal
"3"	Variable speed operation of the secondary pump via PWM signal

Delivered condition 0
Setting range 0 to 3

Parameter group heating water buffer cylinder

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Buffer cylinder"**
4. Select parameter.

7200 Heating water buffer cylinder

"Buffer cylinder 7200"

This function is **only available for system schemes 1 and 2**. The heating water buffer cylinder is optional for system schemes 1 and 2; system schemes 3 to 10 require the heating water buffer cylinder, which is preset.

Value	Explanation
"1"	Heating water buffer cylinder installed
"0"	Heating water buffer cylinder not installed

Delivered condition 0
Setting 1 / 0

7202 Set temperature for "fixed value"

"Fixed temperature 7202"

Set temperature for "Fixed value" operating mode of the heating water buffer cylinder.

Note
The temperature cannot be set higher than the max. temperature in the heating water buffer cylinder (see page 105).

Delivered condition 500 (≙ 50 °C)
Setting range 10 to 700 (≙ 1 to 70 °C)

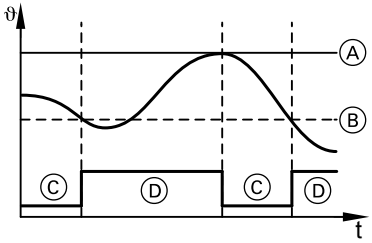
7203 Hysteresis

"Hysteresis, buffer cylinder heating 7203"

7203 Hysteresis (cont.)

The set value determines the deviation from the set temperature of the heating water buffer cylinder (subject to operating mode) at which heating is started and stopped.

Note
*For **system schemes 1 and 2**, this function is only available if option **"1"** was selected under **"Buffer cylinder 7200"**.*



Ⓐ Set temperature
Ⓑ Start hysteresis
Ⓒ Heating the heating water buffer cylinder "OFF"
Ⓓ Heating the heating water buffer cylinder "ON"

Delivered condition	50 (≙ 5 K)
Setting range	20 to 200 (≙ 2 to 20 K)

7204 Maximum temperature

"Maximum temperature 7204"

Upper temperature limit for the heating water buffer cylinder.
Heating of the heating water buffer cylinder ends when this temperature is reached.

7204 Maximum temperature (cont.)

Note

- *For **system schemes 1 and 2**, this function is only available if option **"1"** was selected under **"Buffer cylinder 7200"**.*
- *If the value specified here is below the maximum possible set flow temperature of one of the connected heating circuits, this heating circuit may not be able to be supplied with the calculated flow temperature when there is a greater heat demand.*

Delivered condition	600 (≙ 60 °C)
Setting range	10 to 700 (≙ 1 to 70 °C)

7208 Dual mode temperature heating water buffer cylinder

"Temperature block fixed value mode buffer cylinder 7208"

Temperature limit for the **"Fixed val."** operating status with heating water buffer cylinder (see the operating instructions for further details regarding the operating status).
If the long-term average outside temperature exceeds the dual mode temperature, the control unit block the operation of the heating water buffer cylinder in operating mode **"Fixed val."** (e.g. in summer). The heating water buffer cylinder will then only be heated to the set temperature for operating status **"Normal"**.

If the long-term average outside temperature falls below the dual mode temperature by 0.5 K (hysteresis), operation of the heating water buffer cylinder in operating mode **"Fixed val."** is automatically continued.

Delivered condition	100 (≙ 10 °C)
Setting range	–500 to +500 (≙ –50 to +50 °C)

Parameter group heating circuits

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Heating circuit 1"**
   or
   "Heating circuit 2"
   or
   "Separate cooling circuit"
4. Select parameter.

Note
The parameters in the parameter groups heating circuit 1, heating circuit 2 are identical.

The assignment to the heating circuit is determined by the first digit of the parameter code:
2xxx for heating circuit 1
3xxx for heating circuit 2

2000/2001/2022 Room temperatures and switching times

"Standard room temperature 2000"
"Reduced room temperature 2001"
"Party temperature 2022"

Adjusting the set room temperatures and time programs for all heating circuits (A1, M2).

Operating instructions

Delivered condition	200 (≙ 20 °C)
Setting range	100 to 300 (≙ 10 to 30 °C)

2003 Enabling the remote control

"Remote control 2003"

A Vitotrol 200 remote control unit can be used for each heating circuit.

Vitotrol 200 installation instructions

Value	Explanation
"1"	Vitotrol 200 remote control for the heating circuit is installed and enabled.
"0"	Remote control is not enabled.

Note
*Remote control units have no function when the heat pump is set to **"Manual mode"**.*

2003 Enabling the remote control (cont.)

Delivered condition	0
Setting	1 / 0

2006/2007 Heating curve slope/level

"Heating curve slope 2006"
"Heating curve level 2007"

Heating curve level and slope for all heating circuits (A1, M2).

Operating instructions

	Heating curve level 2007	Heating curve slope 2006
Delivered condition	0 (≙ 0 K)	12 (≙ 1.2)
Setting range	–150 to +400 (≙ –15 to + 40 K)	0 to 35 (≙ 0 to 3.5)

200A Influence of room temperature hook-up

"Slope room hook-up 200A"

The influence of room temperature hook-up can be selected, subject to a room temperature sensor being installed and room temperature hook-up being enabled (see page 108).
The higher the value, the greater the influence of the room temperature on the set flow temperature of the relevant heating circuit with weather-compensated control.

Delivered condition	10
Setting range	0 to 50

200B Room temperature hook-up (heating circuits)

"Room temperature hook-up 200B"

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200B Room temperature hook-up (heating circuits) (cont.)

This parameter determines the conditions under which the set flow temperature with weather-compensated control should be corrected by the room influence.

Value	Explanation
"0"	Weather-compensated control without room influence. Set flow temperature is not corrected.
"1"	Weather-compensated control with room influence only for "Reduced" operating mode.
"2"	Weather-compensated control with room influence only for "Standard" operating mode.
"3"	Weather-compensated control with room influence for "Reduced" and "Standard" operating modes.

Delivered condition 3
Setting range 0 to 3

200E Maximum set flow temperature

"Maximum flow temperature 200E"

Maximum permissible set flow temperature for a heating circuit.
The set flow temperature, which is calculated from the outside temperature and the heating curve, is limited by this parameter to a maximum set flow temperature. For the heating circuit without mixer (A1), limited modulation properties mean the heat pump regulates to the return temperature. The set return temperature is calculated from the set flow temperature minus 5 K.

Note
Since the control unit only limits the set value with this parameter, always install an on-site temperature limiter in the flow of an underfloor heating circuit, to restrict the maximum temperature.

Delivered condition 400 (≙ 40 °C)
Setting range 100 to 700 (≙ 10 to 70 °C)

Parameter group cooling

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Cooling"**
4. Select parameter.

7100 Cooling mode

"Cooling 7100"

Type of cooling mode. Cooling either affects one of the heating circuits or a separate cooling circuit.

Delivered condition 0
Setting range 0 to 3

Value	Explanation
"0"	No cooling.
"1"	"Natural Cooling" Direct cooling using the NC-Box without mixer.
"2"	"Natural Cooling" Direct cooling using the NC-Box with mixer.
"3"	No function.

7101 Cooling circuit

"Cooling circuit 7101"

This parameter specifies whether cooling occurs in one of the heating circuits or in a separate cooling circuit.

Note
Cooling mode is not possible for several heating or cooling circuits simultaneously.

Delivered condition 1
Setting range 1 to 4

Value	Explanation
"1"	Cooling on heating circuit A1
"2"	Cooling on heating circuit M2
"3"	No function
"4"	Cooling a separate cooling circuit

7102 Room temperature separate cooling circuit

"Room temperature 7102"

With this parameter a different set room temperature than for the heating circuits can be specified for the separate cooling circuit. This makes it possible, for example, to also cool a storage room in winter, independent of the set room temperature.

Operating instructions

Delivered condition	200 (≙ 20 °C)
Setting range	100 to 300 (≙ 10 to 30 °C)

7103 Minimum flow temperature for separate cooling circuit

"Minimum flow temperature 7103"

If a lower set flow temperature than the value specified here results due to outside and room temperature according to the cooling curve, the flow temperature is regulated to this value.

Note
Only the set flow temperature is limited with this value, not the actual temperature.
The minimum permissible set flow temperature specified here applies both for cooling a heating circuit as well as for cooling a separate cooling circuit.

Delivered condition	100 (≙ 10 °C)
Setting range	10 to 300 (≙ 1 to 30 °C)

7104 Room hook-up cooling circuit

"Slope room hook-up 7104"

The influence of room temperature hook-up can be selected, subject to a room temperature sensor being installed.

The higher the value, the greater the influence of the room temperature on the set flow temperature of the cooling circuit in weather-compensated cooling mode.

7104 Room hook-up cooling circuit (cont.)

Delivered condition	0
Setting range	0 to 50

7110/7111 Cooling curve (cooling circuit/separate cooling circuit)

"Cooling curve level 7110"
"Cooling curve slope 7111"

If the room temperature does not meet the set value for a prolonged period, the cooling characteristics can be matched to the individual ambient conditions. This is achieved by changing the slope and level of the cooling curve for weather-compensated cooling mode.

Observe the modified cooling characteristics over several days (if possible, await a significant change in the weather) before making further adjustments.

	Cooling curve level 7110	**Cooling curve slope 7111**
Delivered condition	0 (≙ 0 K)	12 (≙ 1.2)
Setting range	–150 to +400 (≙ –15 to + 40 K)	0 to 35 (≙ 0 to 3.5)

5441 603 GB

Parameter group time

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Time"**
4. Select parameter.

7C00 - 7C06 Summertime/wintertime

In the delivered condition, the changeover will always take place in the night from Saturday to Sunday on the last weekend in March and October. This setting can be changed with parameters **"Summertime - month"**, **"Summertime - week"**, **"Summertime - day"**, **"Wintertime - month"**, **"Wintertime - week"**, and **"Wintertime - day"**.

Parameter	Parameter code	Delivered condition	Setting range	
"Automatic summer/wintertime changeover"	**"7C00"**	**"1"**	**"1"** **"0"**	Automatic changeover enabled. Automatic changeover not enabled.
"Summertime - month"	**"7C01"**	**"3"**	**"1"** to **"12"**	January to December
"Summertime - week"	**"7C02"**	**"5"**	**"1"** to **"5"**	First to last week of the month
"Summertime - day"	**"7C03"**	**"7"**	**"1"** to **"7"**	Monday to Sunday
"Wintertime - month"	**"7C04"**	**"10"**	**"1"** to **"12"**	January to December
"Wintertime - week"	**"7C05"**	**"5"**	**"1"** to **"5"**	First to last week of the month
"Wintertime - day"	**"7C06"**	**"7"**	**"1"** to **"7"**	Monday to Sunday

Parameter group communication

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Communication"**
4. Select parameter.

7710 LON communication module

"LON module installed 7710"

If LON communication module is installed in the control unit.

Delivered condition	0
Setting	1 / 0

Value	Explanation
"1"	LON communication module is installed and enabled.
"0"	LON communication module is not enabled.

7798/7777 LON system number/subscriber number

"System number 7798"
"Subscriber number 7777"

Range of numbers in LON addresses. The addresses of LON subscribers consist of three different parts, as in a telephone network (country code, area code, subscriber number). The first part is permanently set to the same value for all Viessmann appliances. The other parts comprise system and subscriber number. This enables subscribers to be grouped according to system number, for example to separate the external heat source in the LON as well.

Note
To avoid communication conflicts, every subscriber number within a system may only be assigned once. The Vitocom communication interface always has subscriber number 99.

7798/7777 LON system number/subscriber number (cont.)

	Subscriber number	System number
Delivered condition	1	1
Setting range	1 to 99	1 to 5

7779 Fault manager

"Fault manager 7779"

Device is fault manager within a system.
This parameter determines whether the device should collect and display all system fault messages. Furthermore, the control unit monitors all subscribers for failure and generates central fault messages.

Value	Explanation
"1"	Device is fault manager.
"0"	Device is not fault manager.

Delivered condition 0
Setting 1 / 0

Note
Only one device may be configured as the fault manager within a system. Exception: The Vitocom communication interface may be an additional fault manager.

779C Receive interval for data

"Receive heartbeat 779C"

Receive interval for the values and messages transmitted via LON.
If no signal is received for a size or message within this cycle time, the control unit sets this value or status to an internal preset until the corresponding value is received again.

Delivered condition 20 min
Setting range 0 to 60 min

7797 Outside temperature via LON

"Outside temperature 7797"

If several subscribers use the current outside temperature value, this can be made available centrally by one device within a system. All other subscribers in the same system can receive the temperature values.

Delivered condition	0
Setting range	0 to 2

Note
Only one subscriber within a system may transmit the outside temperature.

Value	Explanation
"0"	Device captures the outside temperature via the locally connected temperature sensor.
"1"	Device captures outside temperature of another LON subscriber within the same system.
"2"	Device transmits outside temperature. All LON subscribers within the same system can receive these values.

77FF Time via LON

"Time 77FF"

77FF Time via LON (cont.)

This parameter determines the source from which the control unit receives the time and whether it is to be transmitted via LON to other subscribers.

Note
Only one subscriber within a system may transmit the time.

Value	Explanation
"0"	Device receives time from the internal clock of the control unit
"1"	Device receives time from another LON subscriber within the same system.
"2"	Device transmits the time from the internal clock of the control unit. All LON subscribers within the same system can receive the time signal.

Delivered condition 0
Setting range 0 to 2

5441 603 GB

Parameter group operation

Service menu:
1. Press **OK** + ☰ simultaneously for approx. 4 s.
2. **"Coding level 1"**
3. **"Control"**
4. Select parameter.

8800 Lock out controls

"Lock out controls 8800"

For locking and enabling the controls.

Value	Explanation
"0"	Enabling operation in the standard menu and in the extended menu.
"1"	Operation in the standard menu and in the extended menu blocked. Only manual operation possible.
"2"	Operation in the standard menu enabled and in the extended menu blocked.

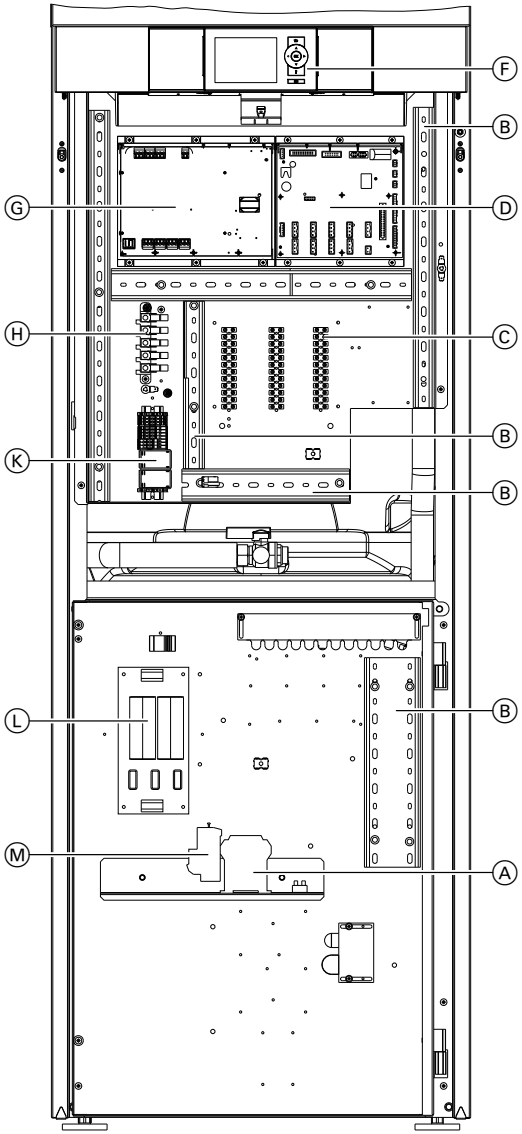
Note
Remote control and maintenance in conjunction with the Vitocom is possible with all settings.

Delivered condition	0
Setting range	0 to 2

Overview of the PCBs and connection options

Overview of electrical connections

Vitocal 242-G, 400 V~



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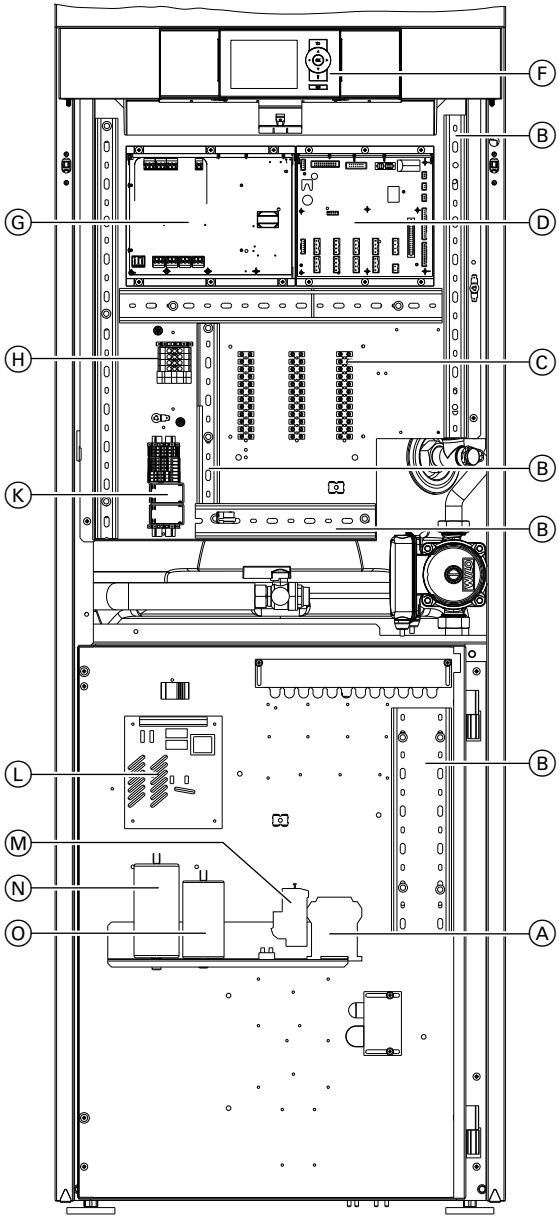
Overview of the PCBs and connection options (cont.)

Ⓐ Compressor contactor
Ⓑ Cable trunking
Ⓒ 3 rows of luster terminals
Ⓓ Controller and sensor PCB
Ⓕ Programming unit
Ⓖ Main PCB
Ⓗ Compressor power supply (below contact protector)
Ⓚ Control module with power supply instantaneous heating water heater (accessory)
Ⓛ ≥ 8 kW: Full wave soft starter
Ⓜ Motor protection switch

Overview of the PCBs and connection options (cont.)

Vitocal 242-G, 230 V~



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Overview of the PCBs and connection options (cont.)

Ⓐ Compressor contactor
Ⓑ Cable trunking
Ⓒ 3 rows of luster terminals
Ⓓ Controller and sensor PCB
Ⓕ Programming unit
Ⓖ Main PCB
Ⓗ Compressor power supply (below contact protector)
Ⓚ Control module with power supply instantaneous heating water heater (accessory)
Ⓛ ≥ 8 kW: Full wave soft starter
Ⓜ Motor protection switch
Ⓝ Run capacitor
Ⓞ Start capacitor

General information regarding the electrical connections

For further information see chapter "Electrical connection", page 26.

- The total output of all components connected directly to the control unit (e.g. pumps, valves, message facilities, contactors) must not exceed 1000 W. If the total output ≤ 1000 W, the individual rating of a component (e.g. pump, valve, message facility, contactor) can be greater than specified. However, never exceed the breaking capacity of the corresponding relay (see page 141).
- In the delivered condition, terminals may have been pre-allocated (subject to appliance version). If two components are connected to the same terminal, press both cores together into a **single** wire ferrule.
- The KM BUS wires are interchangeable.
- The neutral and earth conductors of all components are connected to the luster terminals X2.N and X1.⏚.

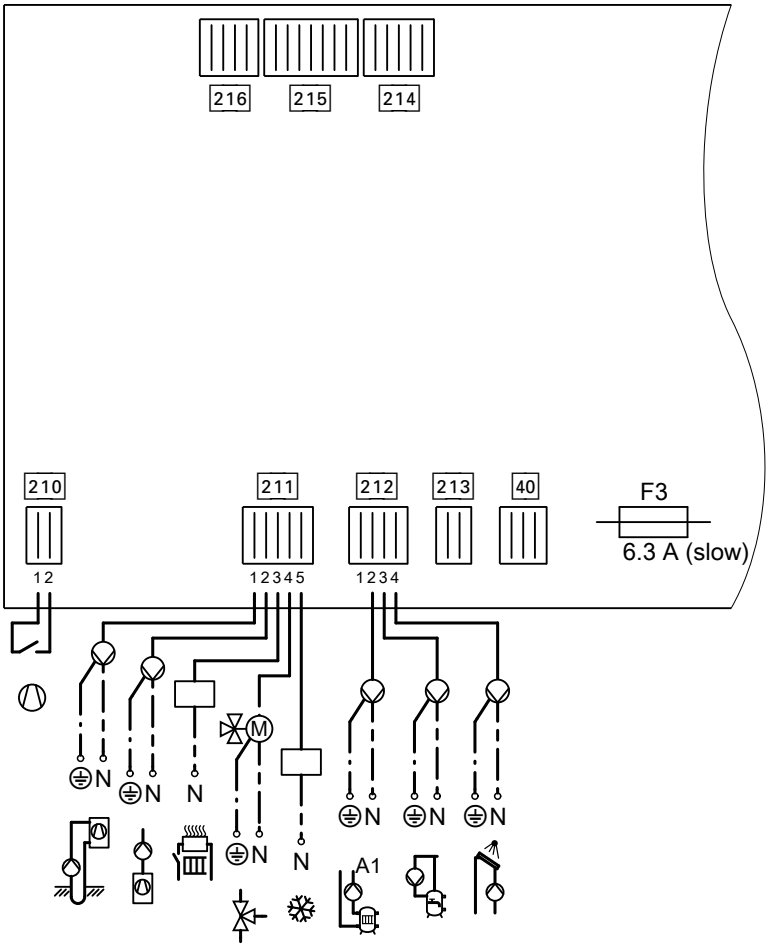
Note

Only the connections to be made are shown in the following PCB diagrams. Pre-allocated connections made at the factory are explained in the tables.

5441 603 GB

Overview of the PCBs and connection options (cont.)

Main PCB (operational components 230 V~)



F3	Fuse 6.3 A (slow)	211/212	On site connections
40	Factory connection	213-216	Factory connections
210	Factory connection		

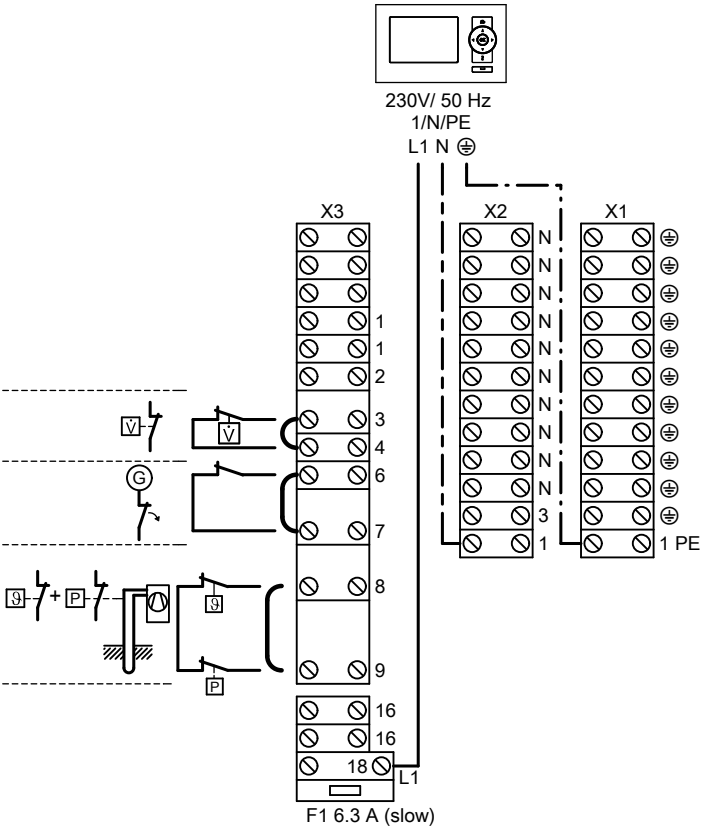
Overview of the PCBs and connection options (cont.)

Operational components 230 V~

Plug	Terminals	Function	Explanation
40		Power supply PCB	Factory connection
210	210.1 210.2	Compressor control via EEV controller (refrigerant circuit control)	■ Heat demand: Contact closed, 210.2 is 'live' Factory connection
	210.1 210.2	End of safety chain	'Live' in case of fault-free safety chain
211	211.1	Primary pump, well pump control	■ Max. output: 200 W Factory connection
	211.2	Secondary pump (for underfloor heating circuit in series with the temperature limiter as maximum temperature limiter for underfloor heating system)	■ In systems without a heating water buffer cylinder, no other heating circuit pump is required (see terminal 212.2) ■ Max. output: 130 W Connect on site
	211.3	Control of the instantaneous heating water heater	Accessories ■ Output 10 W Connect on site
	211.4	Three-way diverter valve heating/DHW Only type 242: And control of the cylinder primary pump	Factory connection
	211.5	NC-Box control (natural cooling)	Connect on site
212	212.2	Heating circuit pump for heating circuit without mixer (A1)	■ This pump is installed in addition to the secondary pump if a heating water buffer cylinder is installed. ■ Max. output: 100 W Connect on site
	212.3	DHW circulation pump	■ Max. output: 50 W ■ Voltage: 230 V Connect on site
	212.4	Solar circuit pump	■ Max. output: 130 W ■ Voltage: 230 V Connect on site

Overview of the PCBs and connection options (cont.)

3 rows of luster terminals (message and safety connections)



F1 Fuse 6.3 A (slow)
X1 Terminals X1.⏚ for the earth conductors of all components
X2 Terminals X2.N for the neutral conductors of all components
X3 ■ Power supply terminals of the control unit "L1" and auxiliary components
■ Switched phase L1: X3.1
■ Terminals for message and safety connections

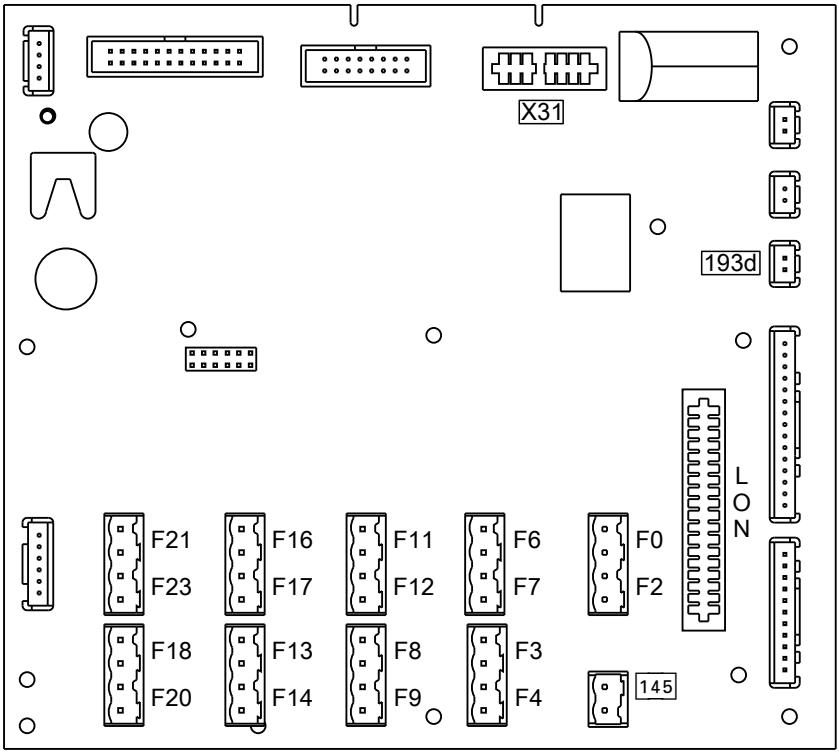
Overview of the PCBs and connection options (cont.)

Message and safety connections

Terminals	Function	Explanation
X3.1	Phase switched	
X3.3 X3.4	Flow switch, well circuit	Zero volt contact required: ■ Closed: Heat pump operational ■ Open: Heat pump shut down ■ Breaking capacity 230 V, 0.15 A Connection on site; remove jumper when connecting
X3.6 X3.7	Power-OFF	Zero volt contact required: ■ Closed: No blocking (safety chain has continuity) ■ Open: Blocking enabled ■ Breaking capacity 230 V, 0.15 A Connection on site; remove jumper when connecting
X3.8 X3.9	Primary circuit pressure switch and/or frost stat **or** Jumper	Zero volt contact required: ■ Closed: Safety chain has continuity ■ Open: Safety chain interrupted; heat pump shut down ■ Breaking capacity 230 V~, 0.15 A Connect on site: ■ Connected in series if both safety components are installed ■ **Insert jumper if no safety components are installed**
X2.1 X3.16	ON/OFF switch	At the programming unit

Overview of the PCBs and connection options (cont.)

Controller and sensor PCB



F.. Plug for sensor
LON Slot for LON module
"X31" Coding card slot

145 KM BUS
193c Control connection (pulse width modulation PWM)

Sensors

Plug	Sensor	Type
F0	Outside temperature sensor Connect on site	Ni 500
F2	Flow temperature sensor, primary circuit Factory connection	Pt 500
F3	Return temperature sensor, primary circuit Factory connection	Pt 500
F4	Buffer cylinder temperature sensor Connect on site	Pt 500

Overview of the PCBs and connection options (cont.)

Plug	Sensor	Type
F6	Cylinder temperature sensor, top Factory connection	Pt 500
F8	Flow temperature sensor, secondary circuit Factory connection	Pt 500
F9	Secondary circuit, return temperature sensor Factory connection	Pt 500
F12	Flow temperature sensor, heating circuit with mixer (M2) Connect on site	Ni 500
F13	System flow temperature sensor (with sensor well, downstream of the heating water buffer cylinder) Connect on site	Pt 500
F14	Flow temperature sensor, cooling circuit (direct heating circuit A1 or separate cooling circuit) Connect on site	Ni 500
F16	Room temperature sensor, separate cooling circuit Connect on site	Ni 500
F18	Solar circuit return temperature sensor Factory connection	Pt 500
F21	Collector temperature sensor Connect on site	Pt 500

Parts list

Information for ordering spare parts.
Quote the part and serial no. (see type plate) and the position no. of the required part (as per this parts list).

Obtain standard parts from your local supplier.

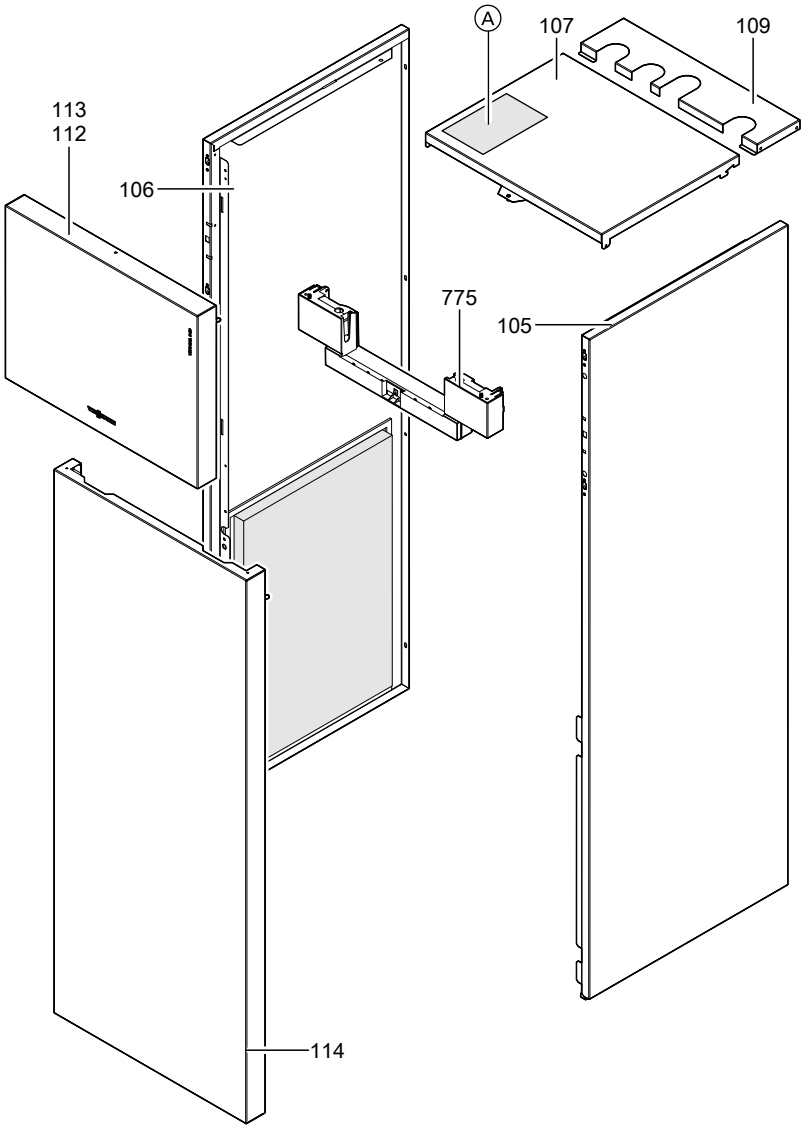
Ⓐ Type plate
112 SATAG front panel
113 Front panel, top
313 Locking clip ∅ 28
314 Locking clip ∅ 25
317 Clip for threaded pipe ∅ 21-23, M8, with EPDM insert
318 Clip for threaded pipe ∅ 26-28, M8, with EPDM insert
319 Clip for threaded pipe ∅ 31-35, M8, with EPDM insert
327 Hose clip DN32 standard
332 Safety spring
500 O-ring 20 x 3.5
501 O-ring DIN3771 34 x 2
502 O-ring pack
504 Gasket pack
506 Pack of clips for threaded pipe
507 Locking clip pack
509 Fastener pack
650 Gasket set A 16 x 24 x 2
651 Gasket 23 x 30 x 2
652 Gasket set A 31 x 38 x 2
759 Expanding rivets

Parts not shown

015 Connection set pack
016 Connection line, DHW flow
124 Line cover
125 Line cover
216 Fixing screws compressor
328 Cap G¾" with loop
329 Safety valve R½", DN15, 10 mbar
334 Contact humidistat
335 Safety equipment block
340 Touch-up paint stick, Vitowhite
341 Spray paint, Vitowhite
342 Installation and service instructions
343 Operating instructions
630 Cylinder temperature sensor NTC
653 Mg chain anode ∅ 26 / 33 x 723 / 693
709 Connection adaptor PCB
710 Connection adaptor PCB, ON/OFF switch
713 Cable harness 230 V~
715 Cable harness, low voltage
717 Vitocal 242-G, 400 V~: 400 V compressor cable
718 Vitocal 242-G, 230 V~: Connecting cable, compressor
719 Connection line secondary pump
720 Primary circuit connection line
721 Diverter valve power cable
722 Diverter valve power cable
723 Cable kit, electronic expansion valve
724 Electronic expansion valve connecting cable
730 Fibre optic cable
733 Hot gas connection line
740 Run capacitor
748 Vitocal 242-G, 400 V~, BWT 106: Control module
749 Vitocal 242-G, 400 V~, BWT 108/110: Control module
752 Vitocal 242-G, 230 V~: Control module
754 Connecting cable
756 Programming unit ribbon cable
760 Plug
761 Plug
762 Plug
768 Frost stat connecting cable
769 Cylinder temperature sensor PT500

Parts list (cont.)

770 Return temperature sensor PT500 solar
771 Terminal appliance fuse
772 Fuse holder
773 Appliance fuse 6.3A



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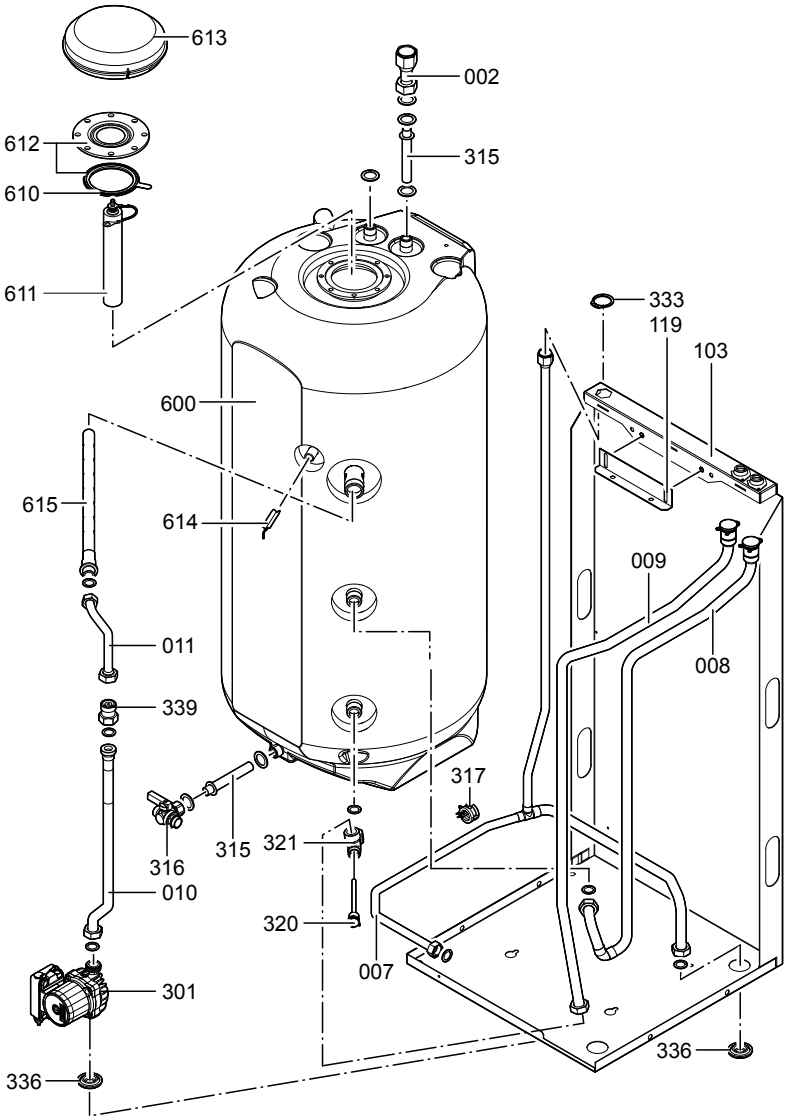
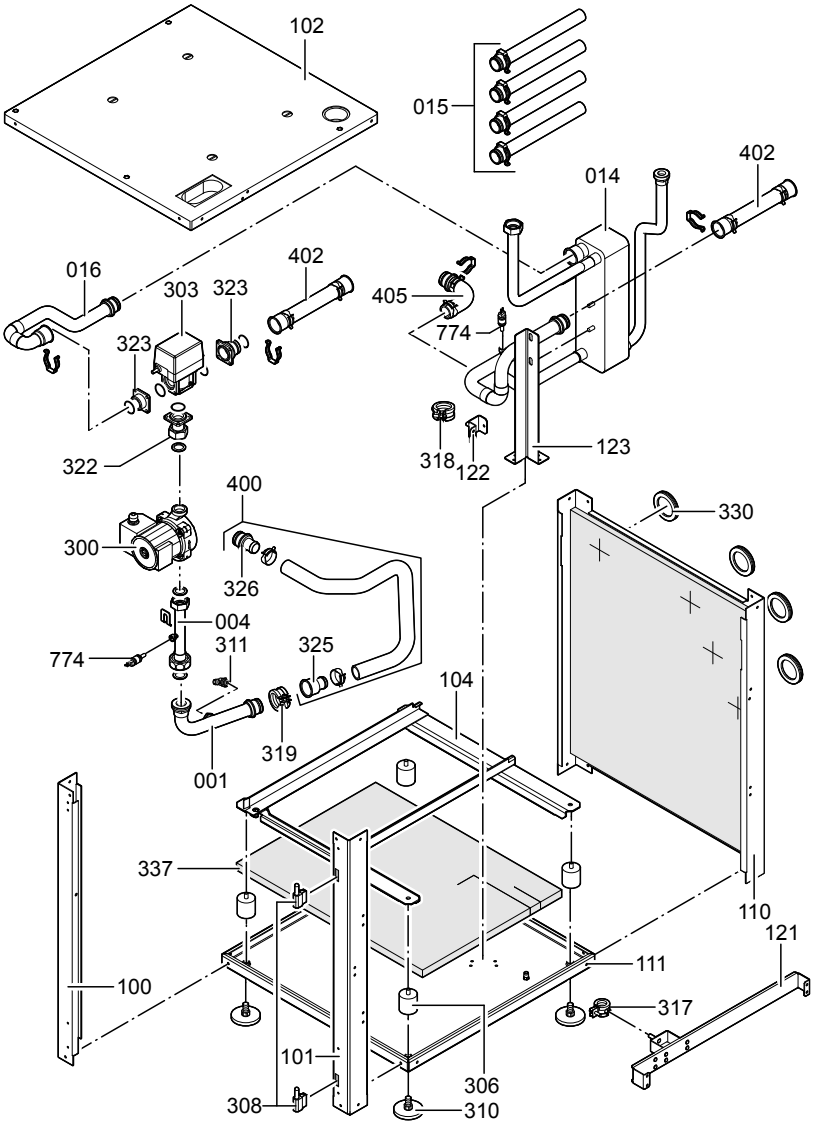
Parts list (cont.)

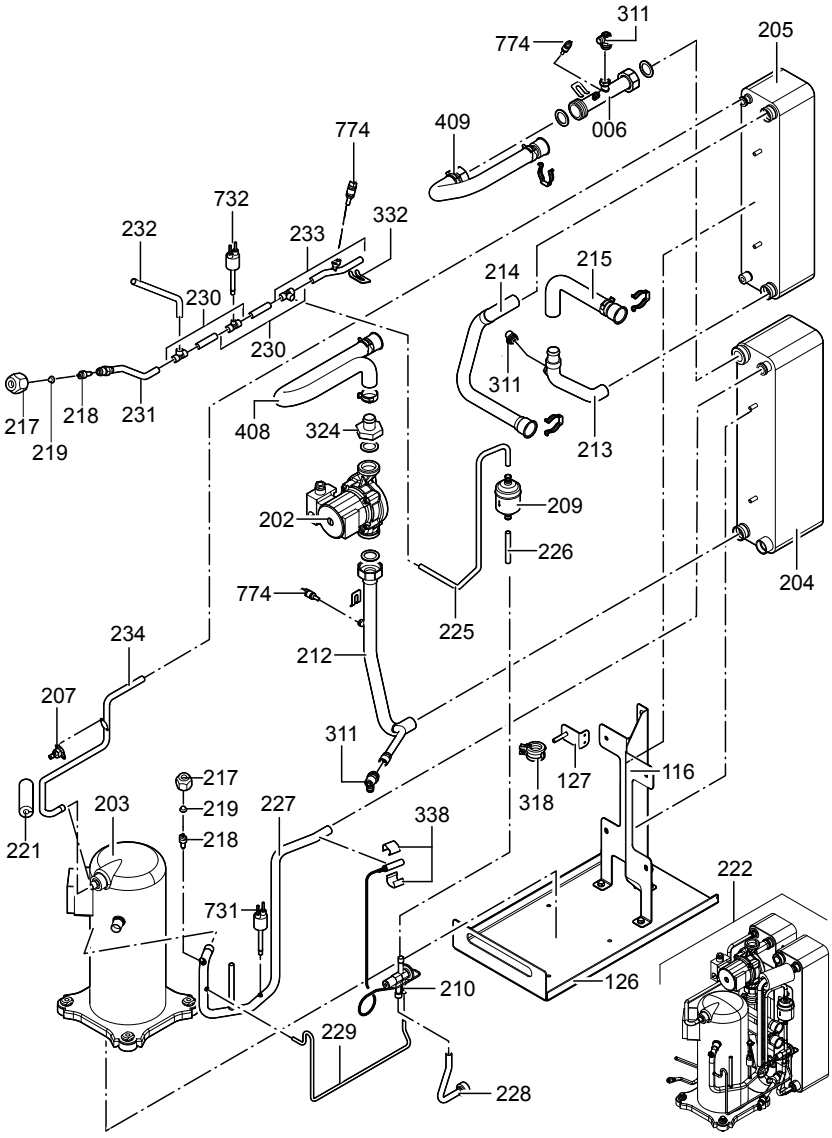


Parts list (cont.)



5441 603 GB

Parts list (cont.)



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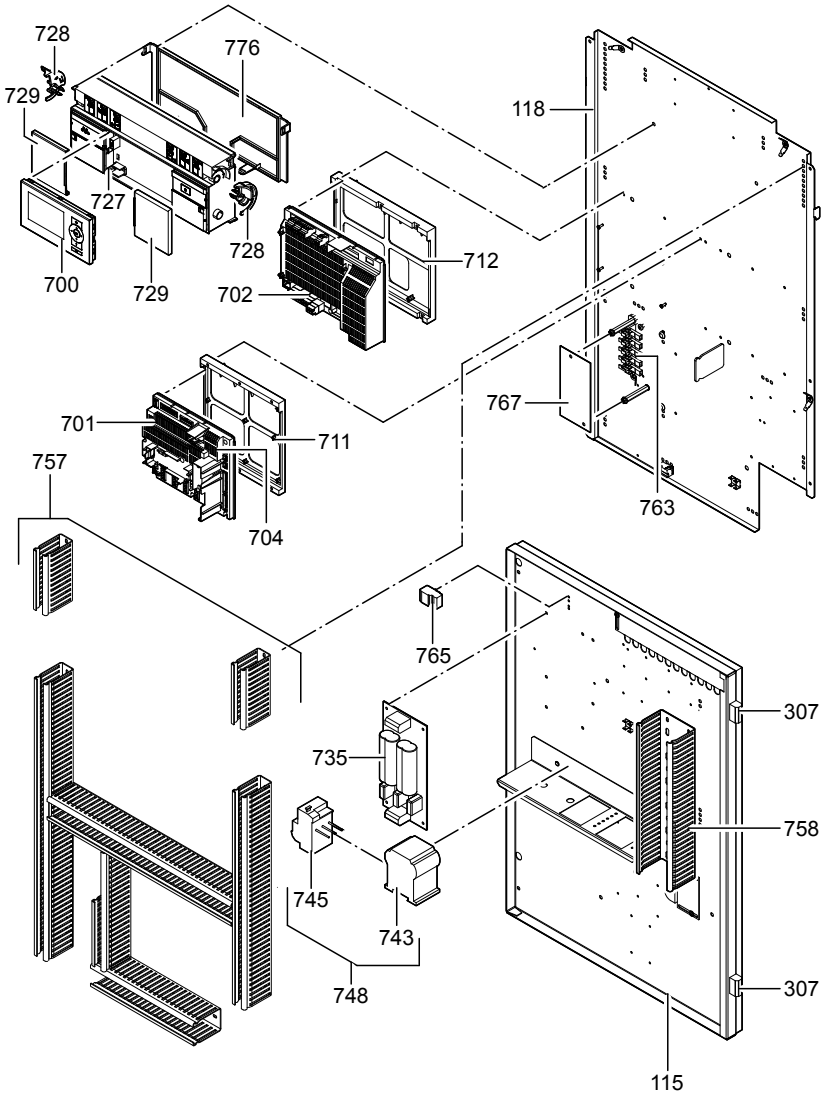
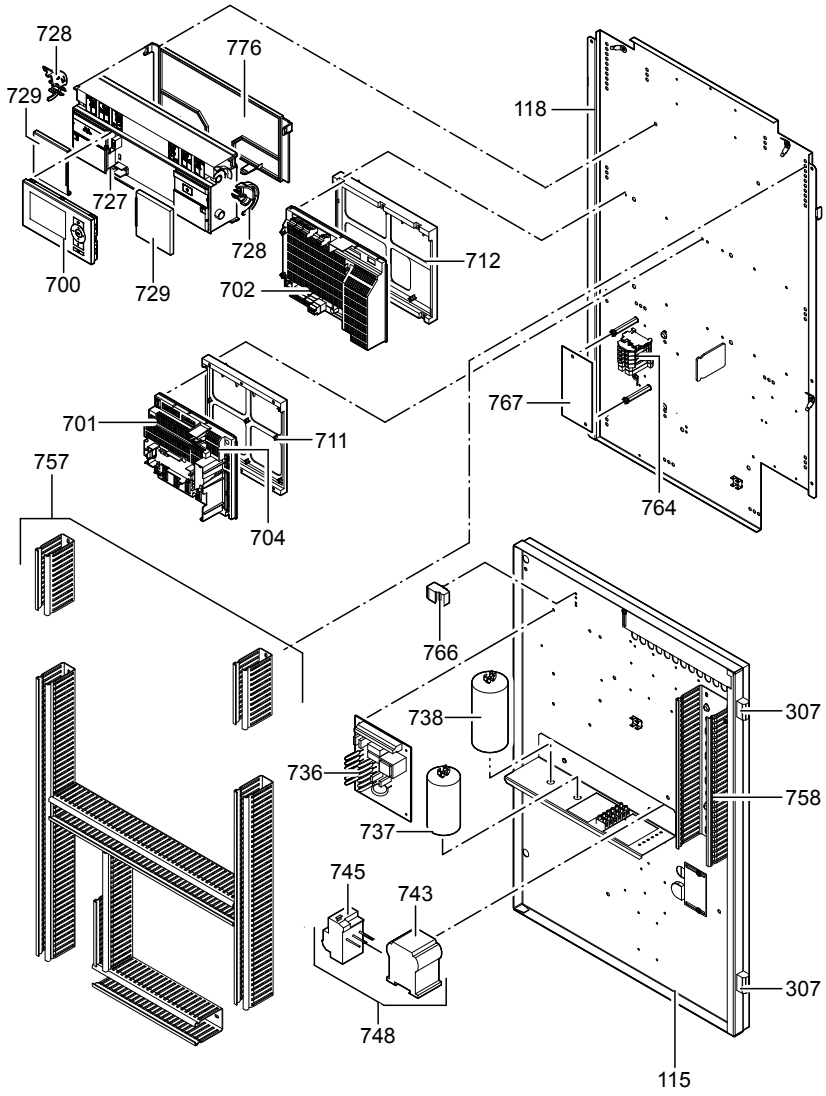
Parts list (cont.)

Vitocal 242-G, 400 V~

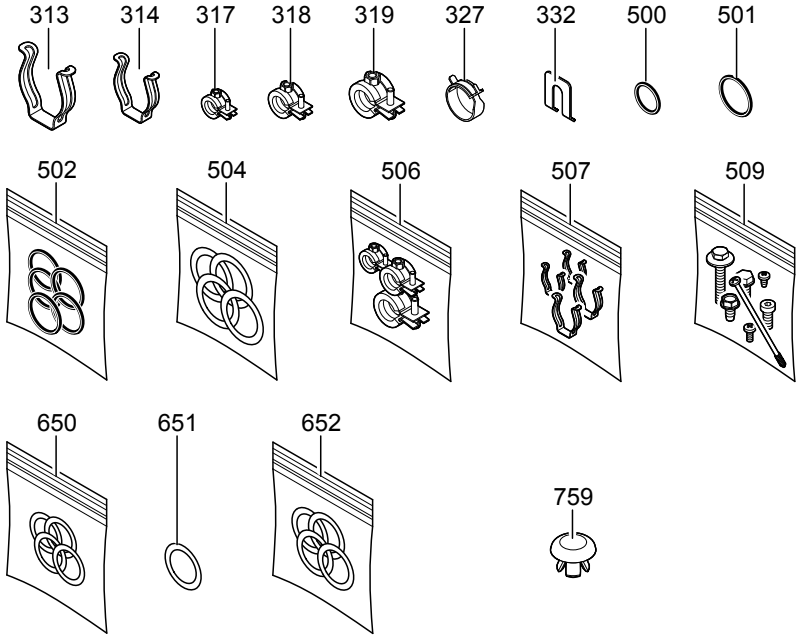


Parts list (cont.)

Vitocal 242-G, 230 V~



Parts list (cont.)



Hydraulic parameters report

Setting and test values		Set value	Commissioning
Antifreeze concentrate primary circuit (brine)	°C	-15	
Overflow valve setting			
After 10 min. operation:			
Primary circuit flow temperature	°C		
Primary circuit return temperature	°C		
Temperature differential ΔT (primary circuit)	K	3 to 5	
Secondary circuit flow temperature	°C		
Secondary circuit return temperature	°C		
Temperature differential ΔT (secondary circuit, observe minimum flow rate)	K	5 to 8	

Control parameter report

For a description of parameters, see from page 78.

Parameter	Code	Delivered condition	Commissioning
System definition			
System scheme	7000	2	
Language	7001	German	
Temperature differential heating	7003	40 (≙ 4 K)	
Temperature differential cooling	7004	40 (≙ 4 K)	
External extension	7010	0	
Swimming pool	7008	0	
Changing the heating circuit operating mode	7011	0	
Effect of operating mode changeover	7012	2	
Duration of operating mode changeover	7013	8 h	
External demand mixer "OPEN"	7014	4	
External blocking mixer "CLOSED"	7015	4	
Vitocom 100	7017	0	
Common system sensor	701B	1	

Control parameter report (cont.)

Parameter	Code	Delivered condition	Commissioning
Compressor			
Enable	5000	1	
Output compressor stage	5030	Rated heating output in accordance with the type plate	
DHW			
Cylinder temperature DHW	6000	500 (≙ 50 °C)	
DHW with e heating	6015	1	
Minimum temperature	6005	100 (≙ 10 °C)	
Maximum temperature	6006	600 (≙ 60 °C)	
DHW hysteresis	6007	70 (≙ 7 K)	
Booster heater hysteresis	6008	100 (≙ 10 K)	
Start optimisation	6009	0	
Stop optimisation	600A	0	
Set temperature 2	600C	600 (≙ 60 °C)	
Temperature sensor 2	600E	No function	
Combi cylinder	6016	No function	
No. of attempts DHW	6017	1	
Cylinder primary pump type	6020	3	
Solar			
Solar control unit type	7A00	0	
Maximum temperature	7A01	1300 (≙ 130 °C)	
Hysteresis solar pump ON	7A02	70 (≙ 7 K)	
Hysteresis solar pump OFF	7A03	30 (≙ 3 K)	
Flow rate	7A07	100 l/h	
Detect faulty circulation	7A09	1	
Electric heater			
Inst. heating water heater	7900	0	
Heating with electro	7902	1	
Maximum stage, electric heating	7907	1	
Stage at power-OFF	790A	0	
Dual mode temperature, electric heating	790B	100 (≙ 10 °C)	

Control parameter report (cont.)

Parameter	Code	Delivered condition	Commissioning
Internal hydraulics			
Heat pump for drying a building	7300	0	
Screed program	7303	0	
Heating/DHW diverter valve	730D	Do not adjust.	
Set flow temperature, external demand	730C	500 (≙ 50 °C)	
Primary source type	7320	0	
Secondary pump type	7340	0	
Heating water buffer cylinder			
Buffer cylinder	7200	0	
Fixed temperature	7202	500 (≙ 50 °C)	
Hysteresis, buffer cylinder heating	7203	50 (≙ 5 K)	
Maximum temperature	7204	600 (≙ 60 °C)	
Temperature block fixed value mode buffer cylinder	7208	100 (≙ 10 °C)	
Heating circuit 1			
Standard room temperature	2000	200 (≙ 20 °C)	
Reduced room temperature	2001	200 (≙ 20 °C)	
Party temperature	2022	200 (≙ 20 °C)	
Remote control	2003	0	
Heating curve slope	2006	12 (≙ 1.2)	
Heating curve level	2007	0 (≙ 0 K)	
Slope room hook-up	200A	10	
Room temperature hook-up	200B	3	
Maximum flow temperature	200E	400 (≙ 40 °C)	
Heating circuit 2			
Standard room temperature	3000	200 (≙ 20 °C)	
Reduced room temperature	3001	200 (≙ 20 °C)	
Party temperature	3022	200 (≙ 20 °C)	
Remote control	3003	0	
Heating curve slope	3006	12 (≙ 1.2)	
Heating curve level	3007	0 (≙ 0 K)	
Slope room hook-up	300A	10	
Room temperature hook-up	300B	3	
Maximum flow temperature	300E	400 (≙ 40 °C)	

Control parameter report (cont.)

Parameter	Code	Delivered condition	Commissioning
Cooling			
Cooling	7100	0	
Cooling circuit	7101	1	
Room temperature	7102	200 (≙ 20 °C)	
Minimum flow temperature	7103	100 (≙ 10 °C)	
Slope room hook-up	7104	0	
Cooling curve slope	7110	12 (≙ 1.2)	
Cooling curve level	7111	0 (≙ 0 K)	
Time			
Automatic summer/wintertime changeover	7C00	1	
Summertime - month	7C01	3	
Summertime - week	7C02	5	
Summertime - day	7C03	7	
Wintertime - month	7C04	10	
Wintertime - week	7C05	5	
Wintertime - day	7C06	7	
Communication			
LON module installed	7710	0	
Subscriber number	7777	1	
System number	7798	1	
Fault manager	7779	0	
Receive Heartbeat	779C	20 min	
Outside temperature	7797	0	
Time	77FF	0	
Control			
Lock out controls	8800	0	

Specification

Connection values of operational components

Components	Connection	Connected load [W]	Voltage [V]	Max. switching current [A]
Primary pump/well pump	211.1	200	230	4(2)
Secondary pump	211.2	130	230	4(2)
Instantaneous heating water heater control, stage 1 (accessory)	211.3	10	230	4(2)
Circulation pump for cylinder heating (heating water side)	211.4	130	230	4(2)
NC-Box control	211.5	10	230	4(2)
Heating circuit pump A1	212.2	100	230	4(2)
DHW circulation pump	212.3	50	230	4(2)
Solar circuit pump	212.4	130	230	4(2)
Total current				max. 5(3) A

Vitocal 242-G, 400 V

Vitocal 242-G	Type	BWT 106	BWT 108	BWT 110
Heating output data at 5 K spread (to EN 14511, B0/W35 °C)				
Rated output	kW	5.9	7.7	10.0
Cooling capacity	kW	4.6	6.0	7.8
Power consumption	kW	1.40	1.84	2.32
Coefficient of performance ∈ (COP)		4.2	4.2	4.3
Heating output data at 10 K spread (to EN 255, B0/W35 °C)				
Rated output	kW	6.2	8.0	10.4
Cooling capacity	kW	4.9	6.4	8.3
Power consumption	kW	1.36	1.77	2.23
Coefficient of performance ∈ (COP), heating		4.5	4.5	4.6
Primary circuit (brine)				
Capacity	l	2.8	3.1	3.4
Minimum flow rate at 5 K spread (always maintain)	l/h	820	1120	1450
Maximum external pressure drop (RFH) at minimum flow rate	mbar	680	630	590
Max. inlet temperature	°C	25	25	25
Min. inlet temperature	°C	–5	–5	–5

Specification (cont.)

Vitocal 242-G	Type	BWT 106	BWT 108	BWT 110
Secondary circuit (heating water)				
Content, heat pump	l	3.3	3.5	3.8
Content, total	l	6.2	6.4	6.7
Minimum flow rate at 10 K spread (always maintain)	l/h	540[*1]	710	910
Maximum external pressure drop (RFH) at minimum flow rate	mbar	580	580	540
Max. flow temperature	°C	60	60	60
Solar circuit				
Capacity	l	7.2	7.2	7.2
Instantaneous heating water heater				
Heating output	kW	9.0 (single stage)		
Rated voltage		3/N/PE 400 V/50 Hz		
Fuse protection		3× B16A single pole		
Electrical values – heat pump				
Rated voltage compressor		3/PE 400 V/50 Hz		
Rated current, compressor	A	5.5	6.0	8.0
Starting current, compressor	A	25.0	14.0[*2]	20.0[*2]
Starting current compressor (with stalled armature)	A	26.0	35.0	48.0
Compressor fuse	A	1 × C 16A three pole	1 × Z 16 three pole	1 × Z 16 three pole
Rated voltage control unit/electronics		1/N/PE 230 V/50 Hz		
Fuse, control unit/electronics (internal)		6.3 A (slow) / 250 V		
Power consumption				
■ Primary pump at stage 1/2/3	W	81/113/151		
■ Secondary pump at stage 1/2/3	W	62/92/132		
■ Cylinder primary pump (PWM)	W	31-88		
Max. power consumption control unit	W	1000	1000	1000
Rated output control unit/electronics	W	5	5	5
IP rating		IP 20	IP 20	IP 20

*[*1] 600 l/h with instantaneous heating water heater*
*[*2] With full wave soft starter*

Specification (cont.)

Vitocal 242-G	Type	BWT 106	BWT 108	BWT 110
Refrigerant circuit				
Refrigerant		R410A	R410A	R410A
Fill volume	kg	2.1	2.1	2.4
Compressor	Type	Hermetically sealed scroll compressor		
Permiss. operating pressure refrigerant circuit high pressure	bar	43	43	43
Permiss. operating pressure refrigerant circuit low pressure	bar	28	28	28
Dimensions				
■ Total length	mm	680	680	680
■ Total width	mm	600	600	600
■ Total height	mm	2075	2075	2075
Total weight	kg	260	260	266
Permiss. operating pressure				
Primary circuit (brine)	bar	3.0	3.0	3.0
Secondary circuit heating water	bar	3.0	3.0	3.0
Secondary circuit DHW	bar	10.0	10.0	10.0
Solar circuit	bar	6.0	6.0	6.0
Connections				
Primary flow and return (brine)	mm	Cu 28 x 1		
Heating flow and return	mm	Cu 28 x 1		
Cold water, hot water	R_P	¾"		
DHW circulation	G	1"		
Heating water flow and return solar thermal system		Viessmann pipe sleeve DN20 multi-connect system		
DHW cylinder				
Capacity	l	220	220	220
Constant DHW output for heating DHW from 10 to 60 °C (B2/W55 °C)	l/h	241	275	309
DHW performance factor N_L to DIN 4708		1.5	1.5	1.5
Max. draw-off rate at the stated DHW performance factor N_L and DHW heating from 10 to 45 °C	l/min	16.8	16.8	17.3
Max. collector area with orientation to the south: Flat plate collector / tube collector	m^2	5 / 3	5 / 3	5 / 3
Permissible DHW temperature in the DHW cylinder	°C	95	95	95
Sound power level (at B0/W35 °C)	dB(A)	46	46	46

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Specification (cont.)

Vitocal 242-G, 230 V

Vitocal 242-G	Type	BWT 106	BWT 108	BWT 110
Heating output data at 5 K spread (to EN 14511, B0/W35 °C)				
Rated output	kW	6.0	7.8	10.1
Cooling capacity	kW	4.6	6.0	7.9
Power consumption	kW	1.50	1.85	2.34
Coefficient of performance ∈ (COP)		4.0	4.2	4.3
Heating output data at 10 K spread (to EN 255, B0/W35 °C)				
Rated output	kW	6.2	8.0	10.4
Cooling capacity	kW	4.9	6.4	8.3
Power consumption	kW	1.45	1.77	2.27
Coefficient of performance ∈ (COP), heating		4.3	4.5	4.6
Primary circuit (brine)				
Capacity	l	2.8	3.1	3.4
Minimum flow rate at 5 K spread (always maintain)	l/h	870	1050	1450
Maximum external pressure drop (RFH) at minimum flow rate	mbar	670	640	590
Max. inlet temperature	°C	25	25	25
Min. inlet temperature	°C	–5	–5	–5
Secondary circuit (heating water)				
Content, heat pump	l	3.3	3.5	3.8
Content, total	l	6.2	6.4	6.7
Minimum flow rate at 10 K spread (always maintain)	l/h	540*3	710	910
Maximum external pressure drop (RFH) at minimum flow rate	mbar	580	581	540
Max. flow temperature	°C	60	60	60
Solar circuit				
Capacity	l	7.2	7.2	7.2
Instantaneous heating water heater				
Heating output	kW	9.0 (single stage)		
Rated voltage		1/N/PE 230 V/50 Hz		
Fuse protection		3× B16A single pole		

*3 *600 l/h with instantaneous heating water heater*

Specification (cont.)

Vitocal 242-G	Type	BWT 106	BWT 108	BWT 110
Electrical values – heat pump				
Rated voltage compressor		1/N/PE 230 V/50 Hz		
Rated current, compressor	A	16.0	17.1	23.0
Starting current, compressor	A	45.0	45.0	45.0
Starting current compressor (with stalled armature)	A	58.0	67.0	98.0
Compressor fuse	A	1 × Z 16A single pole	1 × Z 20 single pole	1 × Z 25 single pole
Rated voltage control unit/electronics		1/N/PE 230 V/50 Hz		
Fuse, control unit/electronics (internal)		6.3 A (slow) / 250 V		
Power consumption				
■ Primary pump at stage 1/2/3	W	81/113/151		
■ Secondary pump at stage 1/2/3	W	62/92/132		
■ Cylinder primary pump (PWM)	W	31-88		
Max. power consumption control unit	W	1000	1000	1000
Rated output control unit/electronics	W	5	5	5
IP rating		IP 20	IP 20	IP 20
Refrigerant circuit				
Refrigerant		R410A	R410A	R410A
Fill volume	kg	2.1	2.1	2.4
Compressor	Type	Hermetically sealed scroll compressor		
Permiss. operating pressure refrigerant circuit high pressure	bar	43	43	43
Permiss. operating pressure refrigerant circuit low pressure	bar	28	28	28
Dimensions				
■ Total length	mm	680	680	680
■ Total width	mm	600	600	600
■ Total height	mm	2075	2075	2075
Total weight	kg	260	260	266

Specification (cont.)

Vitocal 242-G	Type	BWT 106	BWT 108	BWT 110
Permiss. operating pressure				
Primary circuit (brine)	bar	3.0	3.0	3.0
Secondary circuit heating water	bar	3.0	3.0	3.0
Secondary circuit DHW	bar	10.0	10.0	10.0
Solar circuit	bar	6.0	6.0	6.0
Connections				
Primary flow and return (brine)	mm	Cu 28 x 1		
Heating flow and return	mm	Cu 28 x 1		
Cold water, hot water	R_P	¾"		
DHW circulation	G	1"		
Heating water flow and return solar thermal system		Viessmann pipe ferrule DN20 multi-connect system		
DHW cylinder				
Capacity	l	220	220	220
Constant DHW output for heating DHW from 10 to 60 °C (B2/W55 °C)	l/h	241	275	309
DHW performance factor N_L to DIN 4708		1.5	1.5	1.5
Max. draw-off rate at the stated DHW performance factor N_L and DHW heating from 10 to 45 °C	l/min	16.8	16.8	17.3
Max. collector area with orientation to the south: Flat plate collector / tube collector	m^2	5 / 3	5 / 3	5 / 3
Permissible DHW temperature in the DHW cylinder	°C	95	95	95
Sound power level (at B0/W35 °C)	dB(A)	46	46	46

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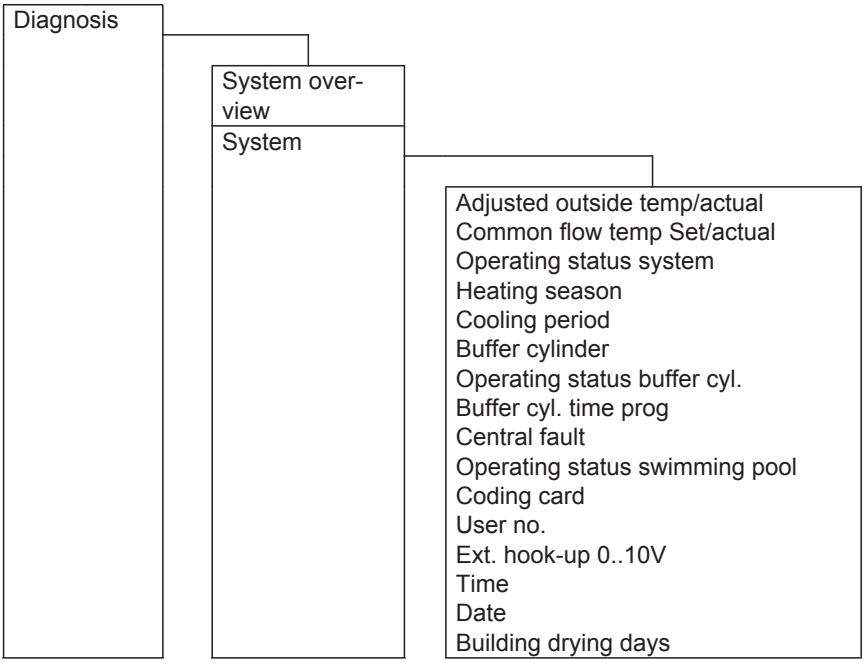
Menu structure

Service menu: Diagnosis



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Menu structure (cont.)

Diagnosis (cont.)	Heating circuit 1/2	Operating program Operating program/Operating status Heating time prog. Time prog htg cool Set room temp Act room temp Red. Set room temp Heating curve Slope heating/Level heating Heating circuit pump Holiday program departure day/return day Mixer Flow temperature Set flow temperature Cooling curve Slope cooling/level cooling Natural Cooling
Diagnosis (cont.)	DHW	Operating program Operating program/Operating status DHW circ time prog. Circulation time prog. Set DHW temperature/Act DHW temp top Cyl. primary pump Cyl. primary pump DHW circulation pump 1 x DHW heating Cylinder reheating Cylinder reheating
Diagnosis (cont.)	Solar	Collector temp Solar DHW Return temp solar Solar energy Collector circuit pump Reheat suppression

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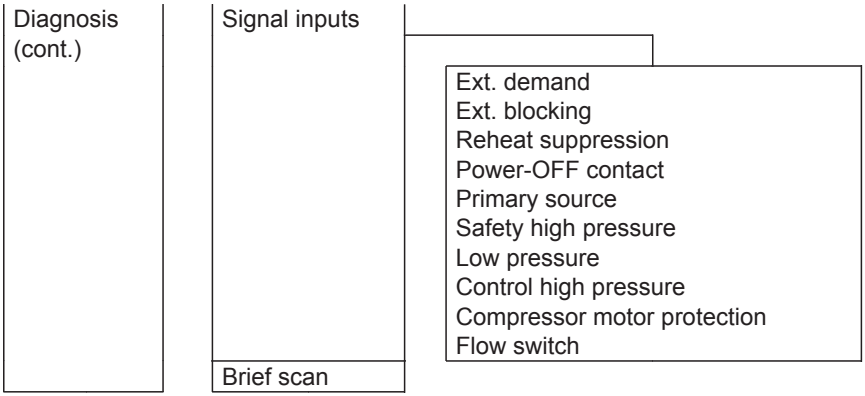
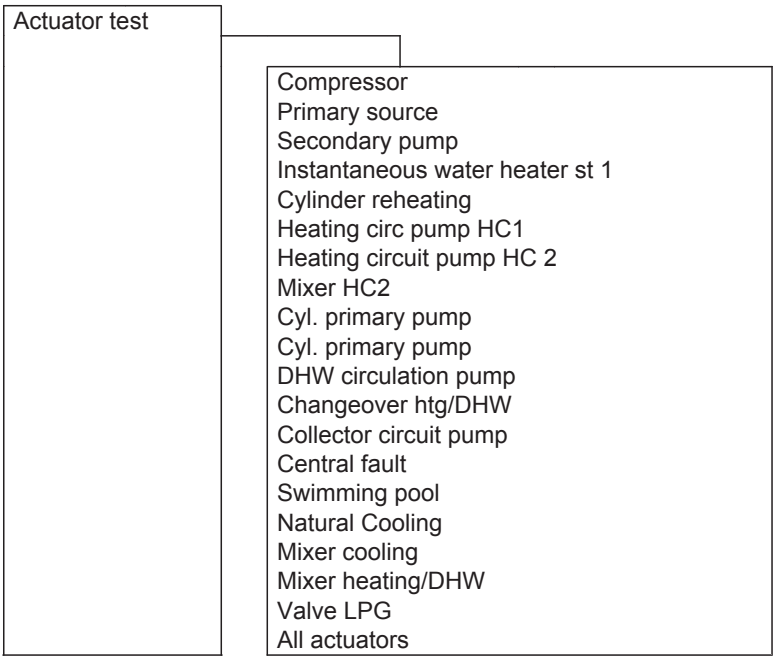
Menu structure (cont.)

Diagnosis (cont.)	Heat pump	Compressor Primary source Secondary pump Valve heating/DHW Compr. hours run Compressor starts Flow temp primary Return temp primary Flow temp secondary Return temp sec. Inst.water htr.st.1 Inst.water htr.st.1 Runtime compressor
Diagnosis (cont.)	Temperature sensors	Outside temperature Flow temp primary Return temp primary Flow temp secondary Return temp sec. Hot gas temperature System flow temp Buffer cylinder Act DHW temp top Collector temp Solar DHW Return temp solar Flow temp. HC2 Room temp. HC1 Room temp. HC2 Supply temp. SKK Room temp. NC

Menu structure (cont.)



Service menu (cont.)



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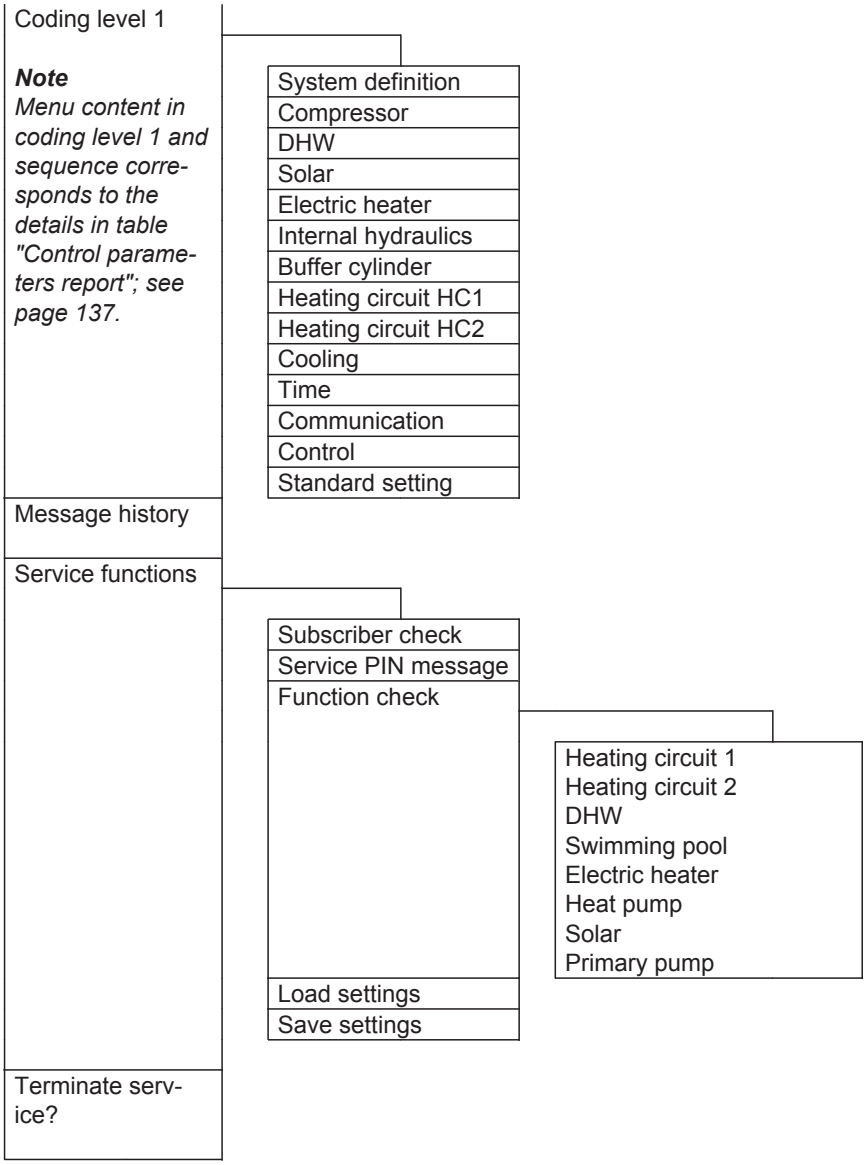
Menu structure (cont.)



Declaration of conformity

We, Viessmann Werke GmbH & Co KG, D-35107 Allendorf, declare as sole responsible body that the product **Vitocal 242-G, incl. Vitotronic 200, type WO1A heat pump control unit** complies with the following standards:

DIN 7003
DIN 8901
DIN 8975
DIN EN 50 090-2-2; 2007-11
DIN EN 50 366; 2006-11
DIN EN 55 014-1; 2007-06
DIN EN 55 014-2; 2009-06
DIN EN 60 335-2-40; 2006-11
DIN EN 60 335-1 with A1/13; 2009–05
DIN EN 55 014-1; 2007-06
DIN EN 61 000-3-3; 2009-06
EN 292/T1/T2
EN 294
EN 349
EN 378; 2002-05
BGR 500, Chapter 2.35

In accordance with the following Directives, this product is designated with CE:

2004/108/EC
97/23/EC
98/37/EC
2006/95/EC

Details according to the Pressure Equipment Directive (97/23/EC): Category I, module A

The **product characteristics determined** as system values for the product **Vitocal 242-G** (see technical guide) can be utilised to assess the energy consumption of heating and ventilation systems to DIN V 4701-10 specified by the EnEV [Germany].

Allendorf, 31 August 2009

Viessmann Werke GmbH&Co KG

pp. Manfred Sommer

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Applicability

Compact heat pump with electric drive, 400 V~ and 230 V~

Output	**Serial number:**	
	Vitocal 242-G, 400 V~	**Vitocal 242-G, 230 V~**
6 kW	7418 031 9 00000 ...	7418 035 9 00000 ...
8 kW	7418 032 9 00000 ...	7418 036 9 00000 ...
10 kW	7418 033 9 00000 ...	7418 037 9 00000 ...

Viessmann Werke GmbH&Co KG
D-35107 Allendorf
Telephone: +49 6452 70-0
Fax: +49 6452 70-2780
www.viessmann.com

Viessmann Limited
Hortonwood 30, Telford
Shropshire, TF1 7YP, GB
Telephone: +44 1952 675000
Fax: +44 1952 675040
E-mail: info-uk@viessmann.com

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